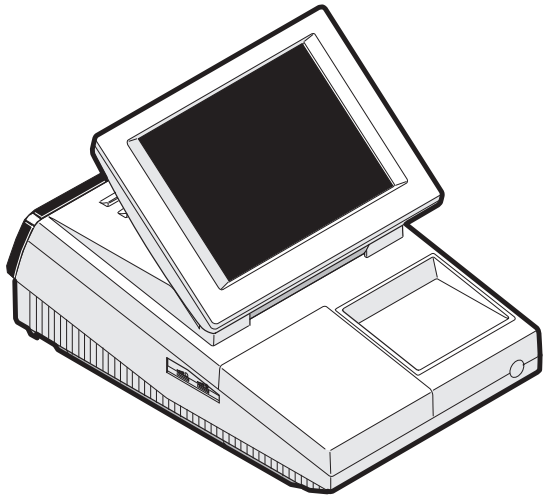
SHARP SERVICE MANUAL

CODE: 00ZUP3300VSME



POS TERMINAL

MODEL UP-3300

(For "V" version)

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PARTS GUIDE

Parts marked with "⚠" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP CORPORATION

This document has been published to be used for after sales service only.
The contents are subject to change without notice.

BATTERY DISPOSAL

Contains Nickel Metal Hydride Battery. Must be Disposed of Properly.

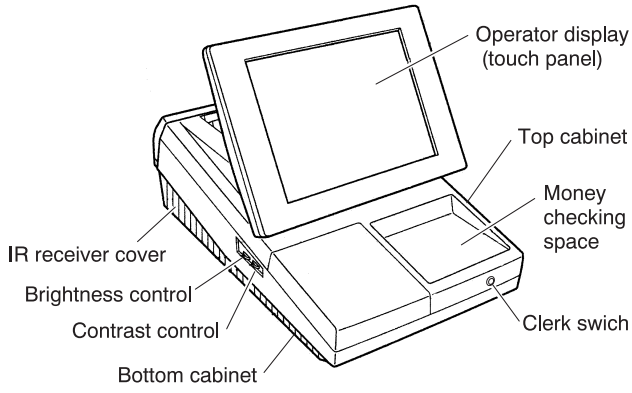
Contact Local Environmental Officials for Disposal Instructions.

CHAPTER 1. SPECIFICATIONS

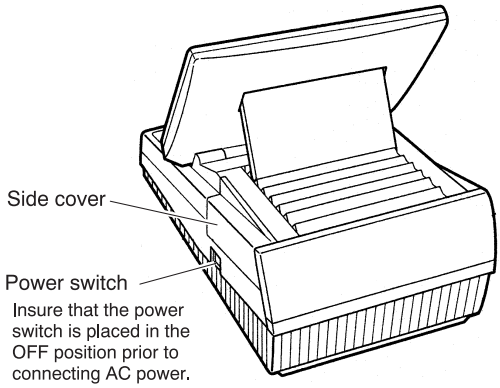
1. Appearance

External view

Front view



Rear view



2. Rating

External dimensions	295(W) × 414.5(D) × 320(H) mm
Weight	7.0 kg
Power source	Official (normal) voltage and frequency.
Power consumption	Stand-by: 44W Operating: 59W (max.)
Working temperatures	0 to 40°C

3. Displays

This POS terminal is equipped with a color LCD operator display.
The operator display is a touch panel.
The operations can be performed by touching the screen (that shows keys or items in the receipt window) of the operator display.

1) Operator display (touch panel)

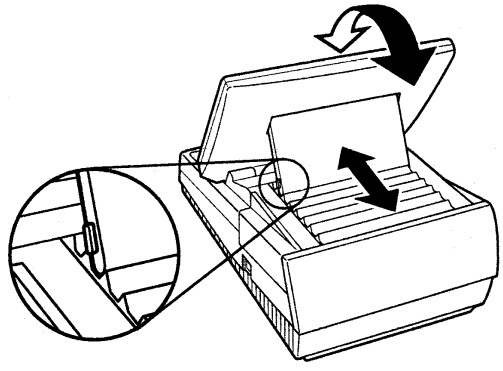
3-1. Display

1) Front display

ITEM	SPECIFICATIONS	NOTE
Type	DSTN color LCD with back light	With 256 colors ∗
Screen size	10.4" Full screen	
Dot format	640 (W) × 480 (H) mm Full dot	
Dot size	0.09 × RGB(W) × 0.31 mm	
Dot space	0.02 mm	

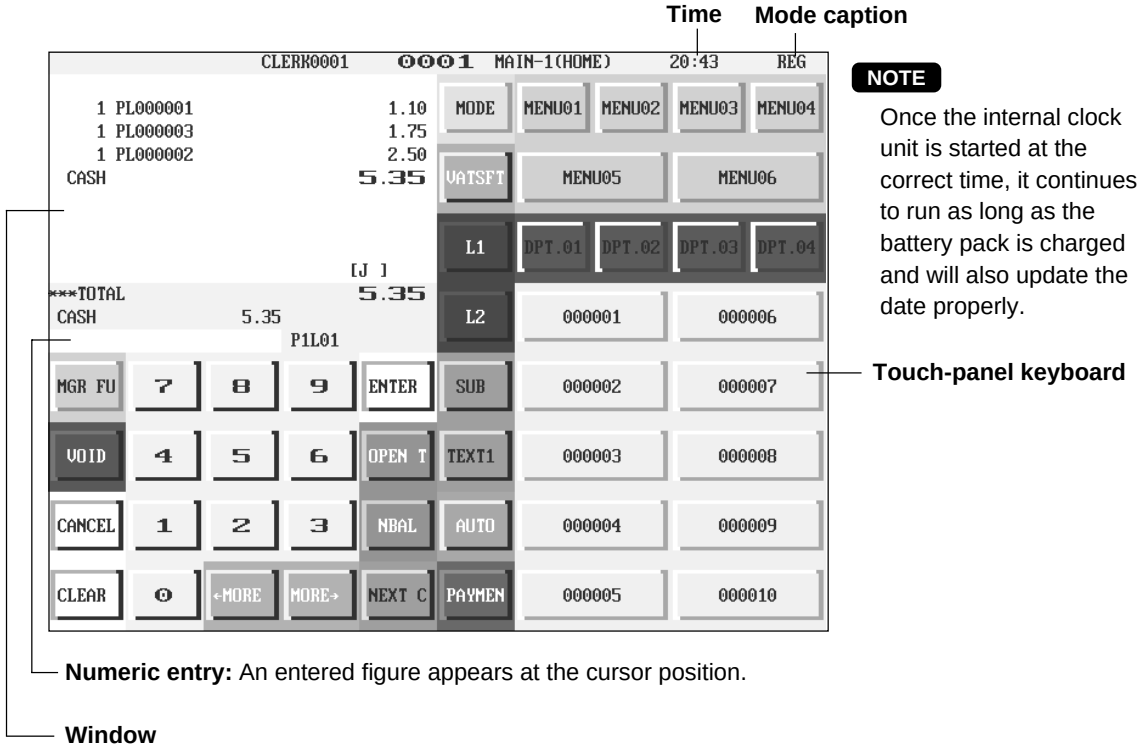
∗ Note that the application software for the UP-3300 uses 16 colors.

The display can be tilted to the best viewing angle by sliding the rear stand.



Be sure to push the button on the rear stand when sliding it.

Screen example (REG mode)

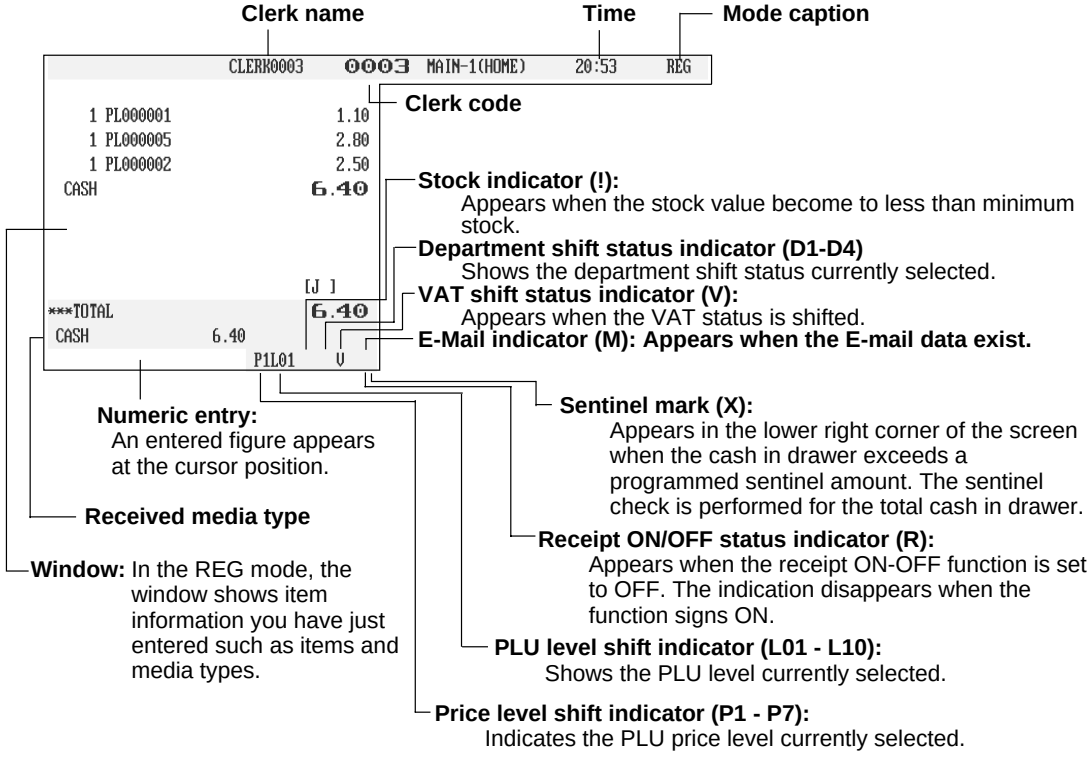


NOTE

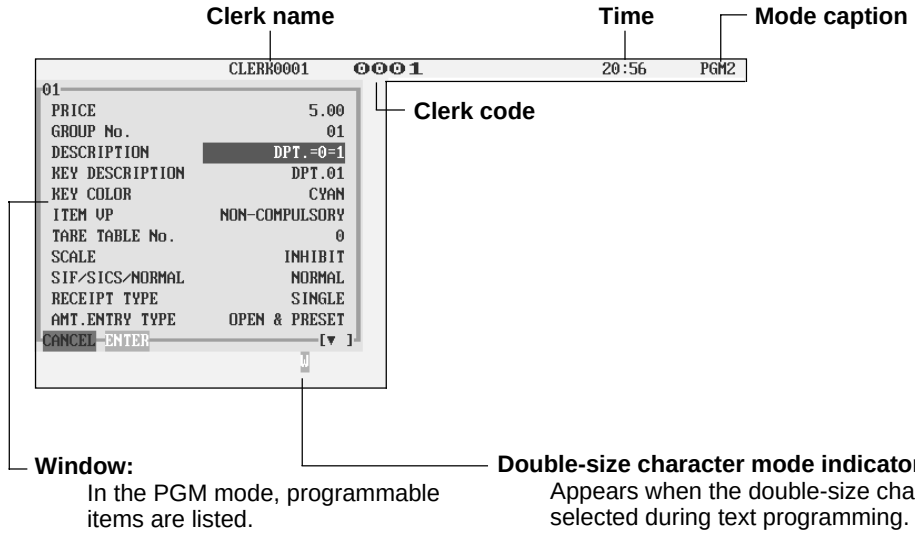
Once the internal clock unit is started at the correct time, it continues to run as long as the battery pack is charged and will also update the date properly.

NOTE: The size of a display area depends on the layout of a touch-panel keyboard (ex. key size) or the function mode (ex. drive-through function).

Display example 1 (REG mode)


Clerk name
Time
Mode caption
CLERK0003 0003 MAIN-1(HOME) 20:53 REG
Clerk code
1 PL000001 1.10
1 PL000005 2.80
1 PL000002 2.50
CASH 6.40
[J]
***TOTAL 6.40
CASH 6.40
P1L01 V
Stock indicator (!): Appears when the stock value become to less than minimum stock.
Department shift status indicator (D1-D4) Shows the department shift status currently selected.
VAT shift status indicator (V): Appears when the VAT status is shifted.
E-Mail indicator (M): Appears when the E-mail data exist.
Numeric entry: An entered figure appears at the cursor position.
Sentinel mark (X): Appears in the lower right corner of the screen when the cash in drawer exceeds a programmed sentinel amount. The sentinel check is performed for the total cash in drawer.
Received media type
Receipt ON/OFF status indicator (R): Appears when the receipt ON-OFF function is set to OFF. The indication disappears when the function signs ON.
Window: In the REG mode, the window shows item information you have just entered such as items and media types.
PLU level shift indicator (L01 - L10): Shows the PLU level currently selected.
Price level shift indicator (P1 - P7): Indicates the PLU price level currently selected.

Display example 2 (PGM mode)



Screen save mode

To save electrical power or the display's life, your POS terminal is provided with the screen save function. This function can turn the LCD backlight off when the POS terminal is left idle for an extended period of time. You can program the time for which your POS terminal should keep the normal status (in which the backlight is "ON") before it goes into the screen save mode.
To exit the screen save mode, touch a key.

Keyboard layout (default)

- **Main1 (Home) keyboard**

  This keyboard appears when you touch the [HOME] key.

					MODE	DRINKS MENUE1	DRINKS MENUE2	DRINKS MENUE3	DRINKS MENUE4
					VATSFT	DRINKS MENUE5		DRINKS MENUE6	
					NORMAL (L1)	Dept.01	Dept.02	Dept.03	Dept.04
					MEDIUM (L2)	Light Beer		Light Beer	
MGR (FNC.12)	7	8	9	ENTER	SUB (SUB1)	Mineral-water		Light Beer	
VOID	4	5	6	GLU	TEXT (FNC.13)	Fanta		Light Beer	
CANCEL	1	2	3	NBAL	AUTO	Coke		Light Beer	
CLEAR	0	MORE ←	MORE →	Next-Condi.	PAYMEN-T (FNC.11)	DAILY MENUE2 (COND.)		Light Beer	

- **Main2 keyboard**

  This keyboard appears when you touch the [MORE→] key on the Main1 (Home) keyboard.

					HOME	DRINKS MENUE1	DRINKS MENUE2	DRINKS MENUE3	DRINKS MENUE4
					VATSFT	DRINKS MENUE5		DRINKS MENUE6	
					NORMAL (L1)	Dept.01	Dept.02	Dept.03	Dept.04
					MEDIUM (L2)	Light Beer		Light Beer	
MGR (FNC.12)	7	8	9	ENTER	TEXT (FNC.13)	Mineral-water		Light Beer	
VOID	4	5	6	GLU	SUB (SUB1)	Fanta		Light Beer	
CANCEL	1	2	3	NBAL	AUTO	Coke		Light Beer	
CLEAR	0	MORE ←	MORE →	Next-Condi.	PAYMEN-T (FNC.11)	DAILY MENUE2 (COND.)		Light Beer	

- **Main3 keyboard**

  This keyboard appears when you touch the [MORE→] key on the Main2 keyboard.

					HOME	DRINKS MENUE1	DRINKS MENUE2	DRINKS MENUE3	DRINKS MENUE4
					VATSFT	DRINKS MENUE5		DRINKS MENUE6	
					NORMAL (L1)	Dept.01	Dept.02	Dept.03	Dept.04
					MEDIUM (L2)	Light Beer		Light Beer	
MGR (FNC.12)	7	8	9	ENTER	TEXT (FNC.13)	Mineral-water		Light Beer	
VOID	4	5	6	GLU	SUB (SUB1)	Fanta		Light Beer	
CANCEL	1	2	3	NBAL	AUTO	Coke		Light Beer	
CLEAR	0	MORE ←	MORE →	Next-Condi.	PAYMEN-T (FNC.11)	DAILY MENUE2 (COND.)		Light Beer	

- **Sub1/Sub2/Sub3 keyboard**

  The Sub1 keyboard appears when you touch the [SUB] key on the Main1 (Home) keyboard.

  The Sub2 keyboard appears when you touch the [MORE→] key on the Sub keyboard.

  The Sub3 keyboard appears when you touch the [MORE→] key on the Sub2 keyboard.

					HOME	START. MENUE 10	FISH MENUE 11	MEAT MENUE 12	DESS. MENUE 13
					VATSFT	SPECIALITIES MENUE14		CHICKEN MENUE 15	
					P2/Pint Auto-key	Dept.01	Dept.02	Dept.03	Dept.04
					TEXT (FNC.14)	FOOD-PLU		FOOD-PLU	
MGR (FNC.12)	7	8	9	ENTER	TEXT (FNC.13)	FOOD-PLU		FOOD-PLU	
VOID	4	5	6	GLU		FOOD-PLU		FOOD-PLU	
CANCEL	1	2	3	NBAL	AUTO	FOOD-PLU		FOOD-PLU	
CLEAR	0	MORE ←	MORE →	Next-Condi.	PAYMEN-T (FNC.11)	FOOD-PLU		FOOD-PLU	

- **Condiment1 keyboard**

  This keyboard appears when you touch the MENU key in a condiment PLU entry.

					HOME	START. MENUE 10	FISH MENUE 11	MEAT MENUE 12	DESS. MENUE 13
					VATSFT	SPECIALITIES MENUE14		CHICKEN MENUE 15	
						KEY01		KEY04	
					TEXT (FNC.14)				
MGR (FNC.12)	7	8	9	ENTER	TEXT (FNC.13)	KEY02		KEY05	
VOID	4	5	6	GLU	SUB (SUB1)				
CANCEL	1	2	3	NBAL	AUTO	KEY03		KEY06	
CLEAR	0	MORE ←	MORE →	Next-Condi.	PAYMEN- (FNC.11)				

- **Condiment2 keyboard**

  The Condiment2 keyboard appears when you touch the MORE→ key on the Condiment1 keyboard.

					HOME	START. MENUE 10	FISH MENUE 11	MEAT MENUE 12	DESS. MENUE 13
					VATSFT	SPECIALITIES MENUE14		CHICKEN MENUE 15	
						KEY07		KEY13	
					TEXT (FNC.14)	KEY08		KEY14	
MGR (FNC.12)	7	8	9	ENTER	TEXT (FNC.13)	KEY09		KEY15	
VOID	4	5	6	GLU	SUB (SUB1)	KEY10		KEY16	
CANCEL	1	2	3	NBAL	AUTO	KEY11		KEY17	
CLEAR	0	MORE ←	MORE →	Next-Condi.	PAYMEN- (FNC.11)	KEY12		KEY18	

- **Condiment3 keyboard**

  The Condiment3 keyboard appears when you touch the MORE→ key on the Condiment2 keyboard.

					HOME	START. MENUE 10	FISH MENUE 11	MEAT MENUE 12	DESS. MENUE 13
					VATSFT	SPECIALITIES MENUE14		CHICKEN MENUE 15	
					P2/Pint Auto-key	KEY19		KEY25	
					TEXT (FNC.14)	KEY20		KEY26	
MGR (FNC.12)	7	8	9	ENTER	TEXT (FNC.13)	KEY21		KEY27	
VOID	4	5	6	GLU	SUB (SUB1)	KEY22		KEY28	
CANCEL	1	2	3	NBAL	AUTO	KEY23		KEY29	
CLEAR	0	MORE ←	MORE →	Next-Condi.	PAYMEN- (FNC.11)	KEY24		KEY30	

- **MENU1/MENU2/MENU3 keyboard**

					HOME	START. MENUE 10	FISH MENUE 11	MEAT MENUE 12	DESS. MENUE 13
					VATSFT	SPECIALITIES MENUE14		CHICKEN MENUE 15	
						FOOD-PLU		FOOD-PLU	
					TEXT (FNC.14)	FOOD-PLU		FOOD-PLU	
MGR (FNC.12)	7	8	9	ENTER	TEXT (FNC.13)	FOOD-PLU		FOOD-PLU	
VOID	4	5	6	GLU	SUB (SUB1)	FOOD-PLU		FOOD-PLU	
CANCEL	1	2	3	NBAL	AUTO	FOOD-PLU		FOOD-PLU	
CLEAR	0	MORE ←	MORE →	Next-Condi.	PAYMEN- (FNC.11)	FOOD-PLU		FOOD-PLU	

- **Function menu 12 (MGR) keyboard**

  This keyboard appears when you touch the MGR (FNC.12) key.

						HOME	EMPLOYEE#	RCP.SW
						VATSFT	CLK#	GCCOPY
						BILL Separate	TIME-IN	Misc-function
						BILL Transfer	TIME-OUT	TRANS-IN
P1	7	8	9	ENTER			BREAK	TRANS-OUT
P2	4	5	6	GLU			WASTE	VIP SALE
CANCEL	1	2	3	NBAL			RA1	PO1
CLEAR	0	00	•	MGR#	D-THRU		RA2	PO2

- **Bill separate/Bill total keyboard**

  This keyboard appears when you touch the BILL SEPARATE or BILL TRANS/TOTAL keyboard.

7	8	9	0	CLEAR	ENTER	CREDIT 1	CREDIT 2	CREDIT 3	CHECK
4	5	6	BILL S.	GLU	AUTO		EX-1	EX-2	SUB TOTAL
1	2	3	BILL T.	NBAL	GC-RCPT (Entertainment)		NC. TIP	CASH/TIP	CASH/TL

- **TEXT1 keyboard**

			HOME	VOID	TEXT 14
			TEXT 08		TEXT 15
			TEXT 09		TEXT 16
			TEXT 10		TEXT 17
TEXT 01	TEXT 05		TEXT 11		TEXT 18
TEXT 02	TEXT 06		TEXT 12		TEXT 19
TEXT 03	TEXT 07		TEXT 13		TEXT 20
TEXT 04	Message to Kitchen (0 price PLU)	Message to Buffet (0 price PLU)	Message to Bar (0 price PLU)		Message to Helper (0 price PLU)

- **TEXT2 keyboard**

			HOME	VOID	TEXT 32
			TEXT 25		TEXT 33
			TEXT 26		TEXT 34
			TEXT 27		TEXT 35
TEXT 21	TEXT 23	TEXT 28			TEXT 36
		TEXT 29			TEXT 37
TEXT 22	TEXT 24	TEXT 30			TEXT 38
		TEXT 31			TEXT 39

- **Function menu 6 (PGM COMMAND) keyboard**

  This keyboard appears when you touch the PGM COMMAND key on the PGM mode keyboard.

					AUTO10
					AUTO11
					AUTO12
					AUTO13
					AUTO14
↓	P UP	HOME			AUTO15
↑	P DOWN	MODE			AUTO16
CANCEL		CLEAR			AUTO17

- **Function menu 7 (X/Z COMMAND) keyboard**

  This keyboard appears when you touch the [X/Z COMMAND] key on the X/Z mode keyboard.

↓	AUTO18	
↑	AUTO19	
CANCEL	AUTO20	
CLEAR	AUTO21	
HOME	AUTO22	
MODE	AUTO23	
	AUTO24	
	AUTO25	

- **Payment menu (PAYMENT) keyboard**

  This keyboard appears when you touch the [PAYMENT] key.

					HOME	DEPOSIT	RA / PO
					VATSFT	(–) DEPOSIT	EXCHANGE 2
					BILL Separate	% DEDUCTION	EXCHANGE 1
					BILL Transfer	(–) DEDUCTION	CREDIT 3
MGR (FNC.12)	7	8	9	ENTER		H-TRANS	CREDIT 2
VOID	4	5	6	GLU		NC. TIP	CREDIT 1
CANCEL	1	2	3	NBAL	AUTO	CASH TIP	CHECK
CLEAR	0	00	•	ST-VOID	GC-RCPT (Entertain-ment)	SUB TOTAL	CASH/TL

- **PGM mode keyboard**

  This keyboard appears when you select the PGM mode.

↑	P UP	CLK#	MGR#		AUTO21
↓	P DOWN	EMPL#	VOID		AUTO22
CANCEL		LIST			AUTO23
CLEAR		MODE			AUTO24
7	8	9	X/QTY		AUTO25
PREVIOUS		NEXT	4	5	6	PGM COMMAND
	TEXT ENTRY		1	2	3	ENTER
DELETE		CALL	0	00	•	CASH

- **X/Z mode keyboard**

  This keyboard appears when you select the X/Z keyboard.

↑	P UP	CLK#	MGR#	AUTO21
↓	P DOWN	EMPL#		AUTO22
CANCEL		LIST		AUTO23
CLEAR		MODE		AUTO24
7	8	9	X/QTY	AUTO25
4	5	6	Z/X COMMAND	
1	2	3	ENTER	
0	00	•	CASH	

- **Drive thru (D-THRU) keyboard**

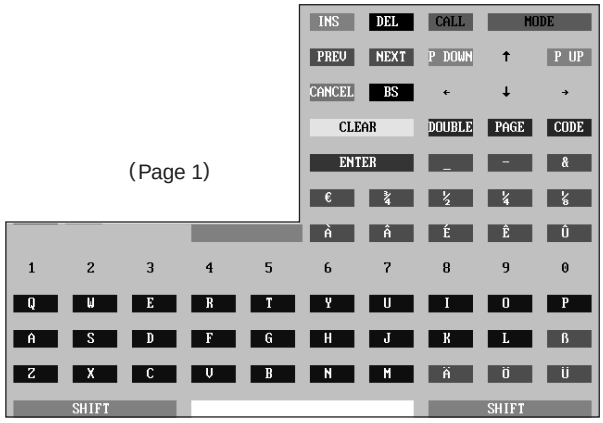
  This keyboard appears when you touch the [D-THRU] key.

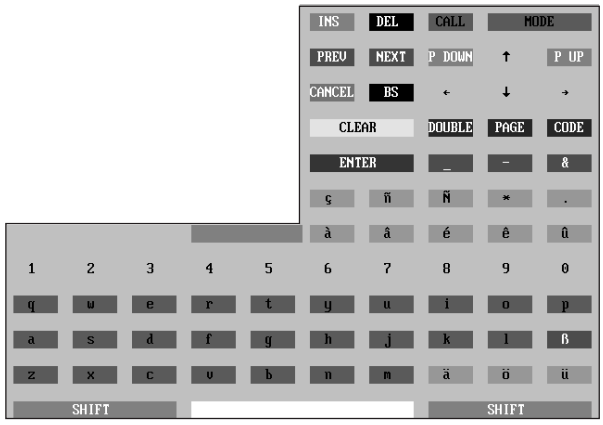
HOME	CANCEL	CLEAR	CLK#	WAIT	NEW CAR ENTRY
HOME	↑	P UP		RECALL	OPEN THE CAR
	↓	P DOWN		VATSFT	ENTER

- **Character keyboard**

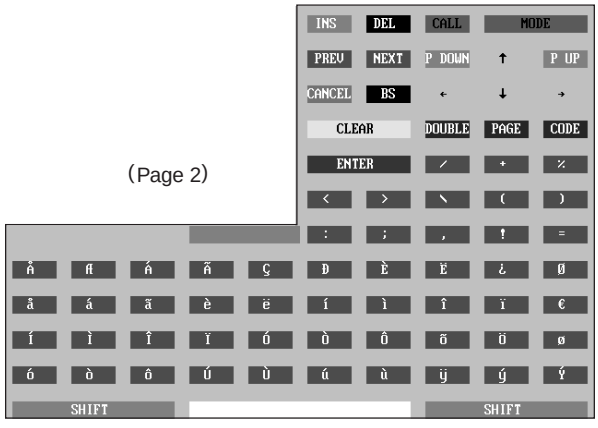
  This keyboard is used when you need to enter text data during PGM2 mode entries.

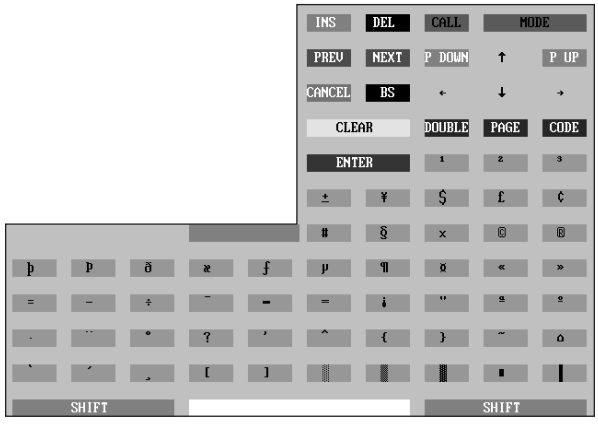
(Page 1)


INS DEL CALL MODE
PREV NEXT P DOWN ↑ P UP
CANCEL BS ← ↓ →
CLEAR DOUBLE PAGE CODE
ENTER _ - &
€ ¾ ½ ¼ ⅛
À Â É Ê Û
1 2 3 4 5 6 7 8 9 0
Q W E R T Y U I O P
A S D F G H J K L ß
Z X C V B N M Ä Ö Ü
SHIFT SHIFT


INS DEL CALL MODE
PREV NEXT P DOWN ↑ P UP
CANCEL BS ← ↓ →
CLEAR DOUBLE PAGE CODE
ENTER _ - &
ç ñ Ñ * .
à â é ê û
1 2 3 4 5 6 7 8 9 0
q w e r t y u i o p
a s d f g h j k l ß
z x c v b n m ä ö ü
SHIFT SHIFT

(Page 2)


INS DEL CALL MODE
PREV NEXT P DOWN ↑ P UP
CANCEL BS ← ↓ →
CLEAR DOUBLE PAGE CODE
ENTER / + %
< > \ ( )
: ; , ! =
Á Ã Á Ã Ç Ð È Ë ¿ Ø
ã á ã è ë Í ì Î ï ¢
Í Ì Î Ï Ó Ò Ô õ Ö ø
ó ò ô Ú Ù ú ù ÿ ý Ý
SHIFT SHIFT



Function keys list (default keyboard and labels)

Caption (default)	Function
HOME	Used to return to HOME keyboard.
CANCEL	Used to cancel your current operation or menu or return to previous menu.
CLEAR	Used to clear the entered data (amounts/rates/parameters, etc.) and the error state.
MODE	Used to go to MODE selection window or to return to HOME keyboard.
↑	Used to control the cursor (up arrow).
↓	Used to control the cursor (down arrow).
←MORE	Used to change the keyboard.
→MORE	Used to change the keyboard.
ENTER	Used to select item/menu or entered data.
SUB	Used to go to the sub-keyboard.
CASH/TL	Used to enter the direct cash/amount tendered operation, or to finalize the PGM job.
0 thru 9	Used to enter a numeric data (0 thru 9).
00	Used to enter a numeric data (00).
000	Used to enter a numeric data (000).
•	Used to enter a fractional part, or to toggle between two or more options.
X/QTY	Used to enter a quantity or time.
SUB TOTAL	Used to display subtotals.
P UP	Used to scroll page up.
P DOWN	Used to scroll page down.
BKSPC	Used to backs up the cursor for deleting the character or figure at the left of the cursor.
DELETE	Used to delete a character or figure in the cursor position.
DIF ST	Used to calculate the difference subtotal.
#	Used to enter a non-add code.
NS	Used to execute a no-sale function.
SCALE	Used to enter a weight for the item entry.
OPN TR	Used to enter the open tare.
PLU	Used to enter a PLU/subdepartment from the list by using a code.
GCCOPY	Used to take a copy of guest check.
L1 thru L10	Used to shift the direct PLU key level (level 1 thru 10).
P1 thru P7	Used to shift the PLU price level (level 1 thru 7).
VP	Used to perform the validation print.
SLIP	Used to print the slip.
RCPT	Used to print the receipt after transaction.
VOID	Used to void a last item, or used for the cursor void function.
ST VD	Used to void an entire transaction (subtotal void).
REFUND	Used to enter the refund item.
RETURN	Used to enter the returned item.
%1 thru %9	Used to enter the percent calculation (percent 1 thru 9).
(–)1 thru (–)9	Used to execute the discount entry (discount 1 thru 9).
VAT	Used to enter the manual VAT.
AUTO to AUTO25	Used to enter the automatic sequencing (auto 1 thru auto 25).
CASH2	Used to enter the cash 2 payment.
CHK thru CHK4	Used to enter the check payment (check 1 thru 4).
CR1 thru CR8	Used to enter the credit sale (credit 1 thru 8).
EXCHANGE1 to EXCHANGE9	Used to creates a subtotal in foreign currency (exchange 1 thru 9).
OPEN THE TABLE	Used to lookup the guest check.
OPEN THE CAR	Used to lookup the guest check (for drive-thru function).
NBAL	Used to open a new guest check.
NEW CAR ENTRY	Used to open a new guest check (for drive-thru function).
FINAL	Used to finalize the guest check temporarily (with the tax calculation).
H.T.	Used to perform the hotell transfer function.
RA and RA2	Used to enter the received-on-account (RA 1 and 2).
PO and PO2	Used to enter the paid-out (PO 1 and 2).
1/2	Used to entry half penny.
AMOUNT	Used to enter an item amount.
PINT	Used to perform the pint entry.
VATSFT	Used to perform the VAT shift entry.
VIP	Used to enter the vip sale.
GUEST#	Used to enter the guest number.
DEPO	Used to enter the deposit.
DEP.RF	Used to refund the deposit.
BILL TRANS/TOTAL	Used to perform the bill transfer/bill totalizing function.
BILL SEPARATE	Used to perform the bill separate function.
TRANS OUT	Used to enter the transfer-out function.
TRANS IN	Used to enter the transfer-in function.
C.BILL	Used to print the bill.
GUEST CHECK RCPT	Used to print the details of the guest check on the receipt.
CASH TIP	Used to enter the cash tip.
NON CASH TIP	Used enter the non-cash tip.
TIP RAID	Used to execute the tip paid function.
WITH	Used to add a PLU to the set PLU.
W/O	Used to delete a linked PLU from the set PLU.
TEXT#	Used to enter the text number to print the free text.
TEXT1 thru TEXT10	Used to print the free text (free text 1 thru 10).
CLK#	Used to enter the clerk code.
CLK01 thru CLK10	Used to assign the clerk.
CHK PR	Used to print the check.
MGR#	Used to enter the manager code.
EMPL#	Used to enter the employee code.
REPEAT	Used to repeat a last item entry.
PERSN#	Used to enter the person number.
I.PAY	Individual payment key
MISC FUNCTIONS	Used to display the miscellaneous function menu.
RCP.SW	Used to switch the receipt printing state (ON/OFF).
TIME-IN	Used to enter time-in operation.
TIME-OUT	Used to enter time-out operation.
BREAK	Break key
D.SFT1 thru D.SFT4	Used to change the department code for a PLU (department shift 1 thru 4).
MENU01 to MENU50	Used to go to the direct PLU menu (menu 1 thru 50).

Caption (default)	Function
(x)/EX	Used to go to the function menu 1 keyboard (q'ty/exchange entry).
%/(–)	Used to go to the function menu 2 keyboard (discount/percentage entry).
MISC	Used to go to the function menu 3 keyboard (the miscellaneous function keyboard).
GUEST CHECK	Used to go to the function menu 4 keyboard (guest check entry).
TEXT	Used to go to the function menu 5 keyboard (text entry).
PGM COMMAND	Used to go to the function menu 6 keyboard (PGM mode command).
X/Z COMMAND	Used to go to the function menu 7 keyboard (X/Z mode command).
PAYMENT	Used to go to the payment menu keyboard.
WAIT	Used to shift the corresponding guest check to the wait mode (for drive-thru).
RECALL	Used to re-call the corresponding guest check to the registration mode (for drive-thru).
WASTE	Used to enter/release the WASTE mode.
NEXT COMMAND	Used to skip the next table of condiments.
D-THRU	Used to go to the drive-thru menu keyboard (guest check entry for drive-thru).
ENTERTAINMENT	Used to print the entertainment bill.

Clerk Keys

This POS terminal allows the operator to use the following four clerk identification systems:

- Real clerk keys (standard 6 clerks/max. 126 clerks)
- Clerk code entry (max. 255 clerks)
- Clerk entry keys (max. 10 clerks)
- WMF clerk keys (max. 127 clerks)

The standard POS terminal has been shipped with the real clerk key system being programmed. If you want to change the clerk identification system, contact your authorized SHARP dealer.

Real clerk keys (1, 2, 3, 4, 5, and 6)

These keys serve to identify clerks. Put one of the 1 through 6 keys in the clerk switch.

Clerk code entry (1 through 9999)

Enter the clerk code by using the following procedure:

XXXX
Clerk code → [CLK#] →

Clerk entry keys

[CLK1] ~ [CLK10]

These keys identify clerks. Touch any one of these keys.

WMF clerk keys

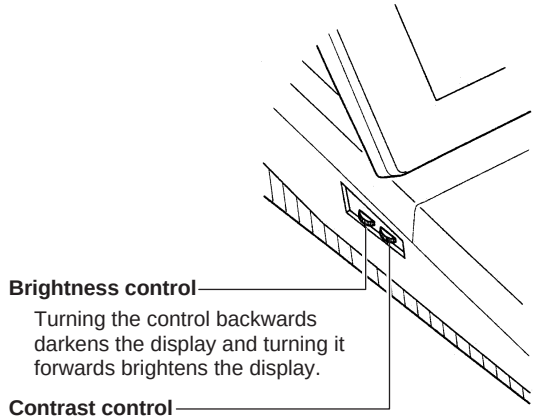
Put one of the WMF clerk keys in the WMF clerk switch.

2) Screen save mode

To save electrical power or the display's life, your POS terminal is provided with the screen save function. This function can turn the LCD backlight off when the POS terminal is left idle for an extended period of time. You can program the time for which your POS terminal should keep the normal status (in which the backlight is "ON") before it goes into the screen save mode.
To exit the screen save mode, touch a key.

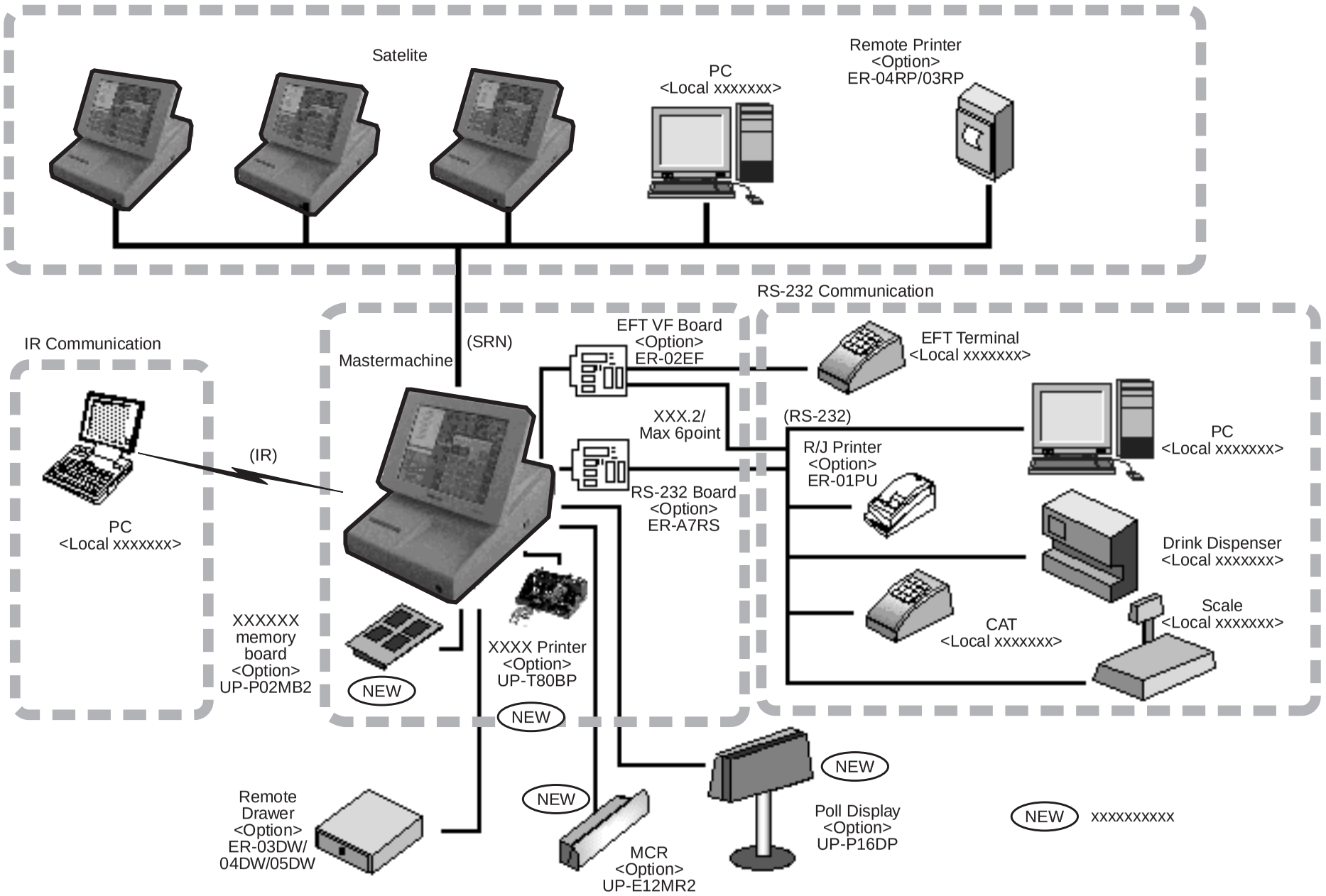
3) Display Adjustment

You can adjust the brightness and contrast of the display by using the corresponding controls.


Brightness control
Turning the control backwards darkens the display and turning it forwards brightens the display.
Contrast control
Turning the control backwards darkens the display and turning it forwards lightens the display.

CHAPTER 2. OPTIONS

1. System configuration



2. Sales Options

No.	CLASSIFICATION	COMPONENT NAME	MODEL NAME	REMARK
1	Printer	External R/J printer	ER-01PU	Via RS-232 I/F
		Remote printer	ER-03RP	Via SRN I/F
			ER04RP	
		Built-in printer	UP-T80BP	Via RS-232 (TTL level)
2	Display	Remote display (Pole type)	UP-P16DP	11-Dig. 7-Seg.+16-Dig. Dot
3	Drawer	Remote drawer	ER-03DW	
			ER-04DW	
			ER-05DW	
		Coin case	ER-48CC2	4B/8C
			ER-48CC3	4B/8C
			ER-58CC2	5B/8C
4	Memory	Expansion RAM disk board	UP-P02MB2	2M bytes PS-RAM board
5	On-line function	RS232 I/F board	ER-A7RS	2 ports RS232 I/F and MCR I/F
6	Data back up system	Preset loader	ER-02FD	FD unit
		IR I/F	CE-IR2	Wireless I/F for IR communication
			CE-IR4	
7	OTHER	MCR (Magnetic Card Reader)	UP-E12MR2	for ISO 1 & 2 stripe card
		EFT terminal I/F	ER-02EF	

3. Local purchase options

No.	COMPONENT NAME	MODEL NAME	
1	External printer	TM-T85/T88	
2	Slip printer	TM-U295	
		TM-H5000	
3	Scale I/F		
4	Drink Dispensor		

4. Service options

No.	NAME	PARTS CODE	DESCRIPTION
1	1 hole clerk key The key No.1 to No.6 ore supplied together with UP-5700.	LKGiM1004BH07	Key No. 7
		LKGiM1004BH08	Key No. 8
		LKGiM1004BH09	Key No. 9
		LKGiM1004BH10	Key No. 10
		LKGiM1004BH11	Key No. 11
		LKGiM1004BH12	Key No. 12
		LKGiM1004BH13	Key No. 13
		LKGiM1004BH14	Key No. 14
		LKGiM1004BH15	Key No. 15
		LKGiM1004BH16	Key No. 16
		LKGiM1004BH17	Key No. 17
		LKGiM1004BH18	Key No. 18
		LKGiM1004BH19	Key No. 19
		LKGiM1004BH20	Key No. 20
		LKGiM1004BH21	Key No. 21
		LKGiM1004BH22	Key No. 22
		LKGiM1004BH23	Key No. 23
		LKGiM1004BH24	Key No. 24
		LKGiM1004BH25	Key No. 25
		LKGiM1004BH26	Key No. 26
		LKGiM1004BH27	Key No. 27
		LKGiM1004BH28	Key No. 28

No.	NAME	PARTS CODE	DESCRIPTION
1	1 hole clerk key The key No.1 to No.6 ore supplied together with UP-5700.	LKGiM1004BH29	Key No. 29
		LKGiM1004BH30	Key No. 30
		LKGiM1004BH31	Key No. 31
		LKGiM1004BH32	Key No. 32
		LKGiM1004BH33	Key No. 33
		LKGiM1004BH34	Key No. 34
		LKGiM1004BH35	Key No. 35
		LKGiM1004BH36	Key No. 36
		LKGiM1004BH37	Key No. 37
		LKGiM1004BH38	Key No. 38
		LKGiM1004BH39	Key No. 39
		LKGiM1004BH40	Key No. 40
		LKGiM1004BH41	Key No. 41
		LKGiM1004BH42	Key No. 42
		LKGiM1004BH43	Key No. 43
		LKGiM1004BH44	Key No. 44
		LKGiM1004BH45	Key No. 45
		LKGiM1004BH46	Key No. 46
		LKGiM1004BH47	Key No. 47
		LKGiM1004BH48	Key No. 48
		LKGiM1004BH49	Key No. 49
		LKGiM1004BH50	Key No. 50
		LKGiM1004BH51	Key No. 51
		LKGiM1004BH52	Key No. 52
		LKGiM1004BH53	Key No. 53
		LKGiM1004BH54	Key No. 54
		LKGiM1004BH55	Key No. 55
		LKGiM1004BH56	Key No. 56
		LKGiM1004BH57	Key No. 57
		LKGiM1004BH58	Key No. 58
		LKGiM1004BH59	Key No. 59
		LKGiM1004BH60	Key No. 60
		LKGiM1004BH61	Key No. 61
		LKGiM1004BH62	Key No. 62
		LKGiM1004BH63	Key No. 63
		LKGiM1004BH64	Key No. 64
		LKGiM1004BH65	Key No. 65
		LKGiM1004BH66	Key No. 66
		LKGiM1004BH67	Key No. 67
		LKGiM1004BH68	Key No. 68
		LKGiM1004BH69	Key No. 69
		LKGiM1004BH70	Key No. 70
		LKGiM1004BH71	Key No. 71
		LKGiM1004BH72	Key No. 72
		LKGiM1004BH73	Key No. 73
		LKGiM1004BH74	Key No. 74
		LKGiM1004BH75	Key No. 75
		LKGiM1004BH76	Key No. 76
		LKGiM1004BH77	Key No. 77
		LKGiM1004BH78	Key No. 78
		LKGiM1004BH79	Key No. 79
		LKGiM1004BH80	Key No. 80
		LKGiM1004BH81	Key No. 81
		LKGiM1004BH82	Key No. 82
		LKGiM1004BH83	Key No. 83
		LKGiM1004BH84	Key No. 84
		LKGiM1004BH85	Key No. 85
		LKGiM1004BH86	Key No. 86
		LKGiM1004BH87	Key No. 87
		LKGiM1004BH88	Key No. 88

No.	NAME	PARTS CODE	DESCRIPTION
1	1 hole clerk key The key No.1 to No.6 ore supplied together with UP-5700.	LKGiM1004BH89	Key No. 89
		LKGiM1004BH90	Key No. 90
		LKGiM1004BH91	Key No. 91
		LKGiM1004BH92	Key No. 92
		LKGiM1004BH93	Key No. 93
		LKGiM1004BH94	Key No. 94
		LKGiM1004BH95	Key No. 95
		LKGiM1004BH96	Key No. 96
		LKGiM1004BH97	Key No. 97
		LKGiM1004BH98	Key No. 98
		LKGiM1004BH99	Key No. 99
		LKGiM1004BH00	Key No. 100
		LKGiM1004BHA1	Key No. 101
		LKGiM1004BHA2	Key No. 102
		LKGiM1004BHA3	Key No. 103
		LKGiM1004BHA4	Key No. 104
		LKGiM1004BHA5	Key No. 105
		LKGiM1004BHA6	Key No. 106
		LKGiM1004BHA7	Key No. 107
		LKGiM1004BHA8	Key No. 108
		LKGiM1004BHA9	Key No. 109
		LKGiM1004BHA0	Key No. 110
		LKGiM1004BHB1	Key No. 111
		LKGiM1004BHB2	Key No. 112
		LKGiM1004BHB3	Key No. 113
		LKGiM1004BHB4	Key No. 114
		LKGiM1004BHB5	Key No. 115
		LKGiM1004BHB6	Key No. 116
		LKGiM1004BHB7	Key No. 117
		LKGiM1004BHB8	Key No. 118
		LKGiM1004BHB9	Key No. 119
		LKGiM1004BHB0	Key No. 120
		LKGiM1004BHC1	Key No. 121
		LKGiM1004BHC2	Key No. 122
		LKGiM1004BHC3	Key No. 123
		LKGiM1004BHC4	Key No. 124
		LKGiM1004BHC5	Key No. 125
		LKGiM1004BHC6	Key No. 126

5. Service tools

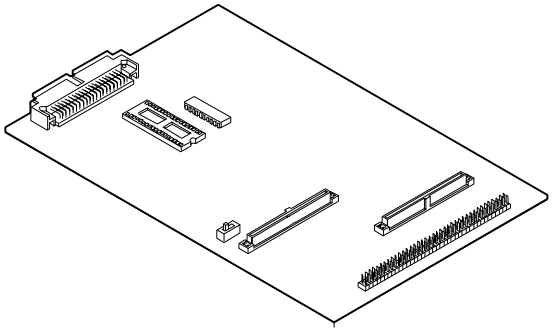
No.	NAME	PARTS CODE	PRICE	DESCRIPTION
1	Terminator(50 Ω)	QCNCM7145RCZZ	AZ	for SRN in-line system
2	MCR test card	UKŌG−6718RCZZ	BE	for UP-E12MR2
3	RS232 loop back connector	UKŌG−6705RCZZ	BC	for RS232 connector
4	Expansion PWB	CKŌG−6724BHZZ	BX	

6. Supplies : None

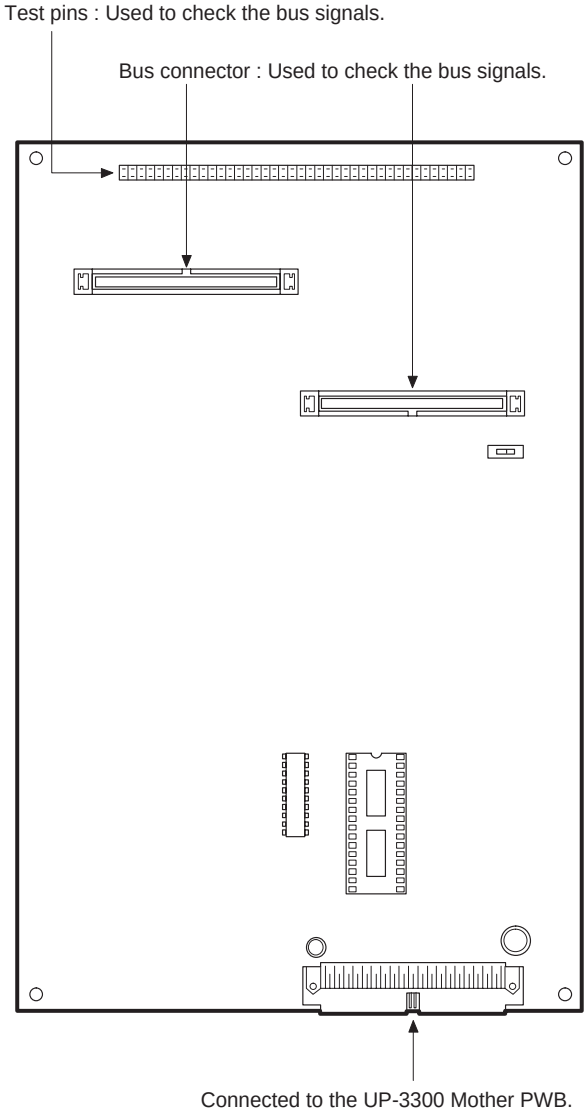
7. How to use service tools

5-1. Expansion PWB : CKOG-6724BHZZ

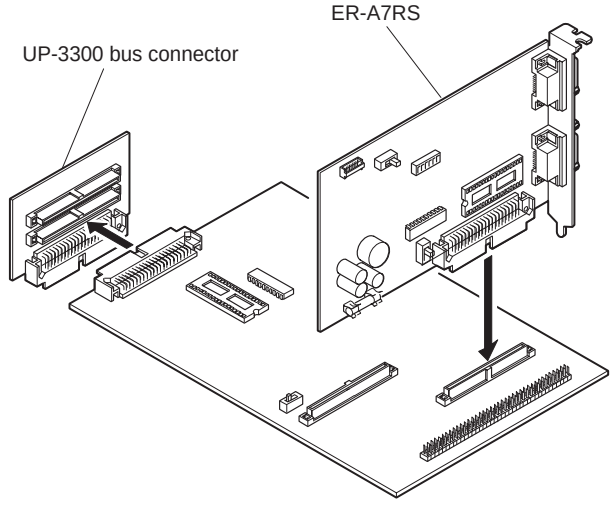
- Extrenal view



- Plain view

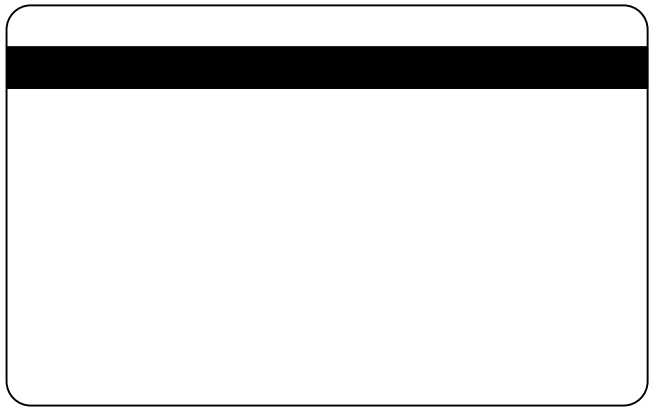


- Connection diagram



5-2. MCR test card: UKOG-6718RCZZ

- Used when executing the diagnostics of the UP-E12MR2.
- External view



CHAPTER 3. SERVICE PRECAUTION

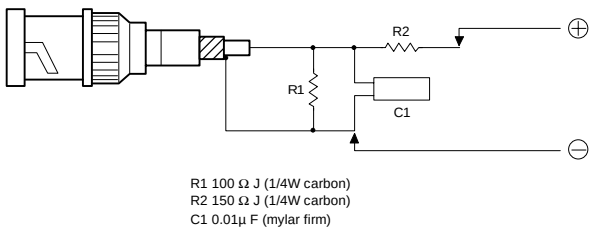
1. Adjustment for SRN (IN-LINE) interface circuit

If transistor Q6 in the transmitter/receiver section has been replaced or if the SRN level requires readjustment, the following alignment is required:

1) Tools and Instruments Required

① Oscilloscope (50MHz or better). 1
② UP-3300 1

2) Dummy Network Specifications



R1 100 Ω J (1/4W carbon)
R2 150 Ω J (1/4W carbon)
C1 0.01µ F (mylar firm)

Fig. 1 Dummy network

The oscillator should be connected to the points indicated by ⊕ and ⊖.

⊕: Connect the positive side of the oscillator.

⊖: Connect the negative side of the oscillator.

3) Connections

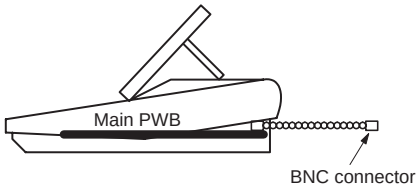


Fig. 2

Attach the BNC connector to the SRN connector (CN2) on the main PWB.

4) Alignment Procedure

① When Using an Oscillator

a) Checking the 1MHz oscillator output

Using an oscilloscope check the 1MHz oscillator's output waveform.

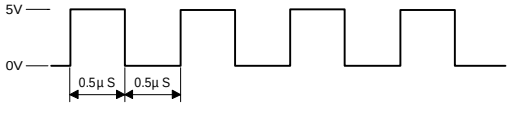


Fig. 3 1MHz oscillator output waveform

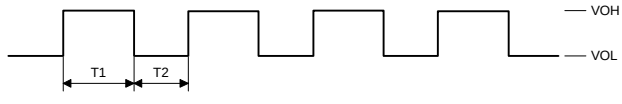
NOTE: The oscillator used should have an output impedance of 50Ω.

b) Connecting the oscillator and its adjustment

Connect a dummy network or branch-trunk network to the output of the SRN connector (CN2), and connect the oscillator to the dummy or branch-trunk network.

∗ Waveform adjustment

Adjust VR1 until the signal waveform as shown in Fig. 5 is obtained across IC5 (pin 15 of the 75115) and GND pin.
Turning VR1 clockwise extends the interval of T1.



T1 = 580 to 620ms
T2 = 380 to 420ms

Fig. 5 Receiver regeneration waveform (with dummy network)

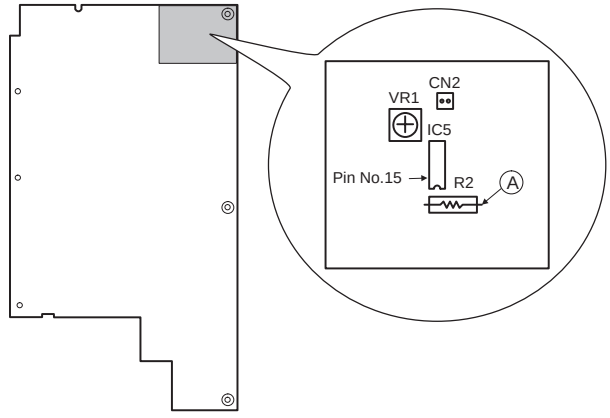


Fig. 6 Board location

2. Calibration

1. Calibration

The coordinates on the touch panel and those on the VGA display may not match for the following reasons.

- The physical deviation between the touch panel and display
- Variations in "electric resistance>coordinate" conversion on the touch panel

Correction of such a deviation is called calibration.

2. Timing of starting calibration

Calibration is started at the following two cases:

– SRV reset/MRS –

1) When touch panel is pressed:
   Calibration is started when PROGRAM reset/MRS is performed with the touch panel pressed.
2) When no calibration has been performed:
   Calibration is started when the calibration data held by the touch panel controller is broken.
   But case 2 isn't performed if case 1 is performed prior to the second.

Calibration is also started when the EEPROM on the touch panel PWB is replaced.

NOTE: If the touch panel unit is replaced for any reason such as a repair, start calibration, following case 1).

3. Calibration specifications

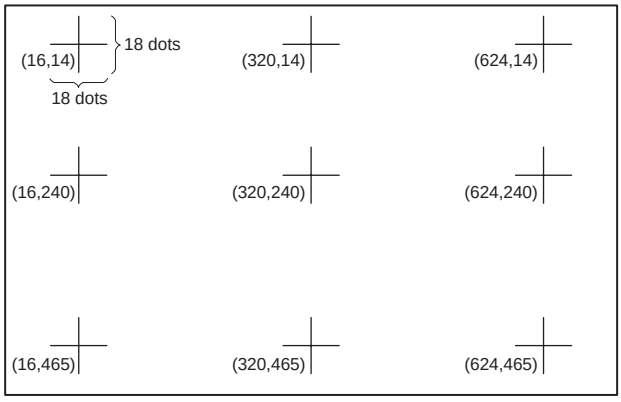
1) The character string "Calibration Mode" is displayed.
2) If the touch is kept pressed, the machine waits for the finger leaving the touch panel.
3) The character string "Touch these crosses" is displayed.
4) Entering correction mode
   The command "Entering correction mode" is issued to the touch panel controller.
   At this step, the coordinate data of the four corners in the input area are passed to the controller.

5) Correction points are displayed

The correction points are displayed.

All of the nine correcting points are displayed as follows using the mark "+". The "+" mark is 18 by 18 dots with 2 dots thick.

VGA Display



6) Correction points are input

Arbitrary correction points are input. Coordinate data corresponding to its input are output from the touch controller. Note the data are those of the initial coordinates. (Refer to the table below.)

The point from where the finger leaves the touch panel is defined as the correction point input position (OFF position).

The data on the nearest correction point is checked, and if almost appropriate, (regarding data of the initial coordinates, within +/-100 dots and +/-5mm in size) the command "correction data set" is issued to the controller. When the panel is released and it is possible to correct with the panel touched, the mark "+" turns green.

If the input coordinates are very far from the correction point, it will be neglected. If the command "correction data set" is terminated normally, the mark "+" at the correction point turns black.

The input coordinate data are those of the initial coordinates, and the relation to the correction points is as follows:

The data of the initial coordinates of correction points

393, 402	2080, 402	3767, 402
393, 2048	2080, 2048	3767, 2048
393, 3697	2080, 3697	3767, 3697

7) Step 6) is repeated for the nine correction points.

Correction is performed in an arbitrary order. At first all of the nine points are displayed in white and they turn black as corrected.

8) After all of the points are corrected, the command "correction mode end" is issued to the controller.

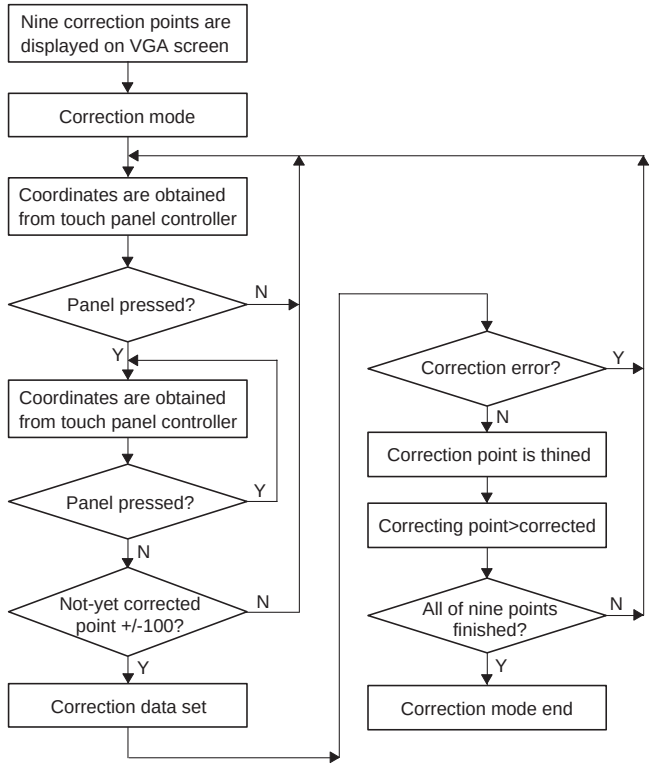
The maximum coordinates are (4096, 4096).

9) The display mode is returned to the text mode.

∗ If the power supply is turned off during correction, the following messages are displayed and all the steps are started over again.

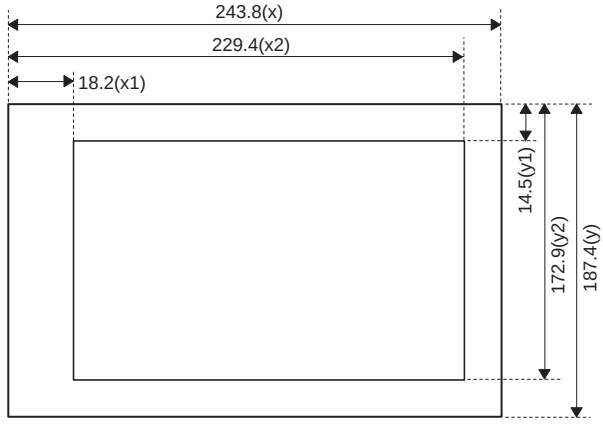
Calibration failed.
Touch the panel to try again

Calibration flow

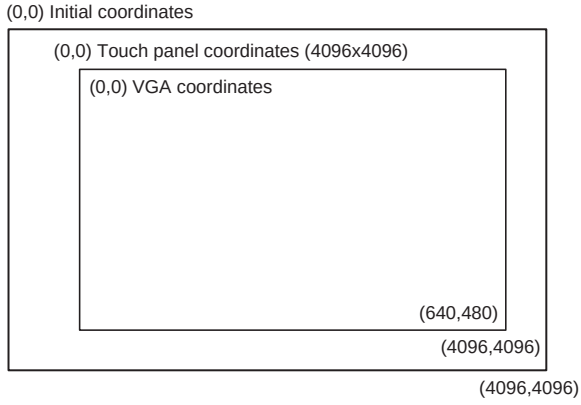


4. Touch panel/VGA coordinates

- Touch panel configuration (unit: mm)



- Touch panel coordinates



Initial coordinates (xi, yi) ↔ Touch panel coordinates (xt, yt) conversion

xt = (xi - 4096*x1/x)*(x / (x2-x1))
yt = (yi - 4096*y1/y)*(y / (y2-y1))

Touch panel coordinates (xt, yt) ↔ VGA coordinates (xv, yv) conversion

xv = xt * 640 / 4096
yv = yt * 480 / 4096

- Coordinates of correction points

Initial coordinates

393, 402	2080, 402	3767, 402
393, 2048	2080, 2048	3767, 2048
393, 3697	2080, 3697	3767, 3697

Touch panel coordinates

100, 100	2048, 100	3996, 100
100, 2048	2048, 2048	3996, 2048
100, 3996	2048, 3996	3996, 3996

VGA coordinates

16, 14	320, 14	624, 14
16, 240	320, 240	624, 240
16, 465	320, 465	624, 465

3. IPL (Initial program Loading) function

1) Introduction

The application software of the UP-3300 written in the flash ROM.

In the following cases, writing procedure of the application software into the flash ROM is required

- When the flash ROM is replaced with new one. The service part flash ROM does not include the application software in it.
- When IPL writing is required because of change in the software.

∗ The service part ofthe main PWB unit includes the flash ROM with the application software written in it, and there is no need for writing the application software when replacing the main PWB unit.

2) IPL procedure

There are two ways of IPL procedures.

- IPL from P-ROM via ER-A7RS
- IPL from PC via IR (infrared) communication (Please refer the next section)

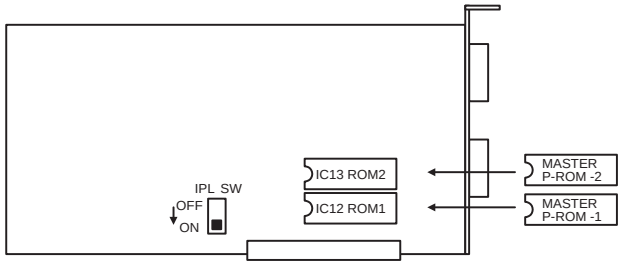
The detailed descriptions on the above procedures are given below.

3) IPL from P-ROM via ER-A7RS

(1) Install the two master ROMs to the IC socket (IC12 , IC13) on the ER-A7RS.

Master ROM -1 : VHI27801RAFxx
Master ROM -2 : VHI27801RAGxx

(2) IPL sitch on the ER-A7RS : Set the IPL SW to ON position.



(3) Install the ER-A7RS to the UP-3300. (The UP-3300 power should be turned OFF.)

(4) Turned on the power of the UP-3300.

(5) The buzzer sounds intermittently during the running of IPL and the program finishes after the buzzer gives five beeps at short intervals.

(6) Turn OFF the power of the UP-3300.

(7) Remove the ER-A7RS from the UP-3300.

(8) Perform the Master reset .

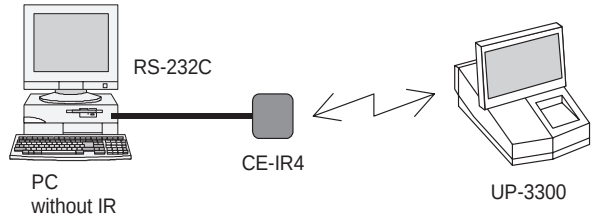
4. UTL33.EXE (UP-3300 Series Utility tool)

1. Outline

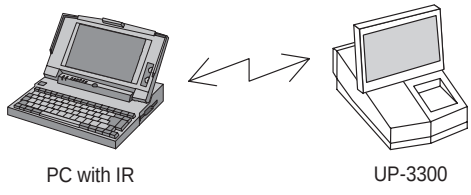
This specification covers the utility program "UTL33.EXE" for UP-3300 series. The "UTL33.EXE" is a program which runs on the PC DOS prompt screen, it is connected to the UP-3300 through IR. It has the following functions: (1) UP-3300 IPL operation; (2) LOGO data rewrite for built-in printer UP- T80BP; and (3) program rewrite.

2. System requirements

PC and UP-3300 are connected through IR.



1. PC + CE-IR4 system



2. PC only system

Fig 1. Connection between PC and UP-3300

3. Functions

The following three functions become available:

(1) UP-3300 program rewrite (IPL)

The UP-3300 program is updated. S-type files or ER01FD type data files are used for ROM data.

(2) LOGO data rewrite

The LOGO STAMP data for the UP-T80BP is set.

Black-and-white BMP/PCX data is used and the image size is up to 576x240 dots.

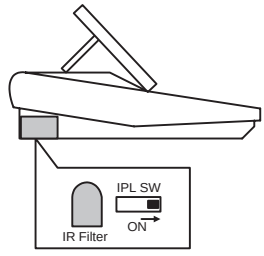
(3) Program rewrite (IPL)

The UP-T80BP program is updated. S-type files are used for ROM data.

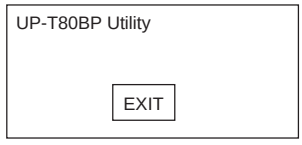
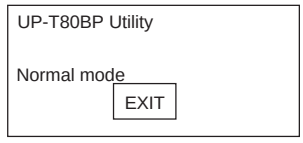
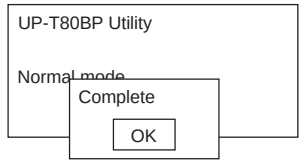
According to the contents of the file, "UTL33.EXE" automatically selects the appropriate protocol from the three types described above. 1

4.

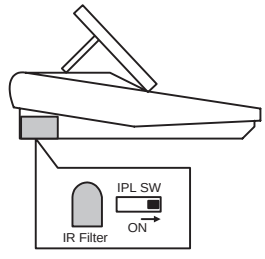
4.1 UP-3300 IPL

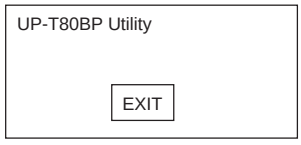
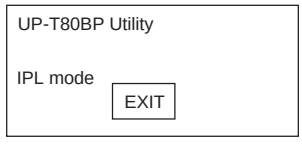
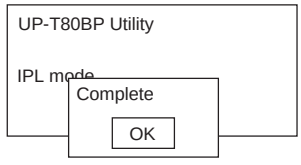
No	Procedure on P.C. side	No	Procedure on UP-3300 side
1	Install "UTL33.EXE" on the P.C.		
		2	Turn OFF the power.
		3	Select "IPL Mode". Set "IPL Switch" of UP-3300 to "ON". 
		4	Turn ON the power.
		5	Starting of "IPL Mode". UP-3300 shows "IPL from IR" IPL from IR
6	Connect P.C. and UP-3300 via IR. (Fig 1)		
7	Execute "UTL33.EXE" on P.C. Operation: **>UTL33 3300_1.ROM 3300_2.ROM** ("3300_1.ROM" and "3300_2.ROM" are file name of S-type ROM object.)		
8	Program data is sent to UP-3300 automatically.	8	Program data is received from P.C. automatically. UP-3300 shows IPL from IR Connected IRDA 115200 21 22 23 24 25 26 27 28
9	"UTL33.EXE" is completed. P.C. shows "Completed."	9	UP-3300 shows "Completed." IPL from IR Connected IRDA 115200 21 22 23 24 25 26 27 28 29 2A 2B 2C 2D 2E 2F Completed. IPL from IR Connected IRDA 115200 30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F Completed.
		10	Turn OFF the power.
		11	Select "Normal Mode". Set "IPL switch" to "OFF".
		12	Execute "Service Reset" on UP-3300.

4.2 UP-T80BP LOGO

No	Procedure on P.C. side	No	Procedure on UP-3300 side
1	Install "UTL33.EXE" on the P.C.		
		2	Enter the SRV mode. Then turn OFF the power or UP-3300.
		3	While pressing the On-Line key, tum ON the power of UP-3300. Keep pressing the On-Line key, and then press the Feed key also. (Don't move a finger from the On-line key.)
		4	UP-T80BP enters into LOGO mode. UP-T80BP prints out "**********".
		5	Go into "UP-T80BP Utility mode". Select "6 UP-T80BP Utility" in SRV mode.
		6	Starting of "UP-T80BP Utility mode". UP-3300 shows 
7	Connect P.C. and UP-3300 via IR. (Fig 1)		
8	Execute "UTL33.EXE" on P.C. Operation: **>UTL33 LOGO.BMP** ("LOGO.BMP" is a file name of Bit-Map image.)		
9	Program data is sent to UP-3300 automatically.	9	Program data is received from P.C. automatically. 
10	"UTL33.EXE" is completed. P.C. shows "Completed."	10	ER-3300 shows "Completed."  And UP-T80BP prints out the LOGO image.
		11	Touch "OK" button.
		12	Touch "EXIT" button.
		13	Turn OFF the power of UP-3300.
		14	Execute "Master Reset" on UP-T80BP.

4.3 UP-T80BP IPL

No	Procedure on P.C. side	No	Procedure on UP-3300 side
1	Install "UTL33.EXE" on the P.C.		
		2	Turn OFF the power of UP-3300.
		3	Select "IPL Mode" on UP-T80BP. Set the Bit 1 of DipSwitch 2 to "ON" to enter "IPL Mode". 
		4	While pressing both the Feed key and the On-Line key, turn ON the power of UP-3300. The ERROR Lamp and the On-line Lamp of UP-T80BP is blinking.

No	Procedure on P.C. side	No	Procedure on UP-3300 side
		5	UP-T80BP enters into IPL mode when the Feed key is pressed. (UP- T80BP clears the application program which is in its own flash ROM.) The ERROR Lamp is blinking and the On-Line Lamp is turned off.
		6	UP-T80BP waits the application program data. The ERROR Lamp is turned off and the On-Line Lamp is turned on.
		7	Enter "UP-T80BP Utility" mode. Select "6 UP-T80BP Utility" in SRV mode
		8	Starting of "UP-T80BP Utility" mode. UP-3300 shows 
9	Connect P.C. and UP-3300 via IR. (Fig 1)		
10	Execute "UTL33.EXE" on P.C. Operation: **>UTL33 T80BP.ROM** ("T80BP.ROM" is a file name of S-type object.)		
11	Program data is sent to UP-3300 automatically.	11	Program data is received from P.C. automatically.  The On-line Lamp of UP-T80BP starts blinking.
12	"UTL33.EXE" is completed. P.C. shows "Completed."	12	ER-3300 shows "Completed."  The On-line Lamp of UP-T80BP stops blinking.
		13	Touch "OK" button.
		14	Touch "EXIT" button.
		15	Turn OFF the power of UP-3300.
		16	Select "Normal Mode" on UP-T80BP. Set the Bit 1 of DipSwitch 2 to "OFF" to enter "Nomal Mode".
		17	Execute "Master Reset" on UP-T80BP.

<Usage of "UTL33.EXE">

"UTL33.EXE" is a utility program on P.C. - a program that sends the application program data of UP-3300, the image data of the Logo stamp of UP-T80BP or the application program data of UP-T80BP in order to replace them.

Syntax

UTL33 [-Fn] [-Cn] filename [filename ...]

Parameter

filename

Specifies the name file which you want to send.

For UP-3300 IPL	S-type ROM object file
For UP-T80BP LOGO STAMP	BMP/PCX file
For UP-T80BP IPL	S-type ROM object file

Switches

-Fn

Specifies the function. Valid values for n are in the range 1 through 3.

1: UP-3300 IPL

2: UP-T80BP LOGO STAMP

3: UP-T80BP IPL

Normally, UTL33.EXE takes the suitable function automatically. If the automatic selection does not work correctly, please use this switch.

-Cn

Specifies the number of the serial (COM) port. Valid values for n are in the range 1 through 2.
The default value is 1 (COM1).

Example

For UP-3300 IPL.

UTL33 3300_1.ROM 3300_2.ROM

For UP-T80BP LOGO STAMP (To use COM2).

UTL33 -C2 LOGO.BMP

For UP-T80BP IPL (To use the switch "-F").

UTL33 -F3 80BP.ROM.

5. Conditions for soldering circuit parts

To solder the following parts manually, follow the conditions described below.

PARTS NAME	PARTS CODE	LOCATION	CONDITIONS FOR SOLDERING
Ceramic oscillator	RCRMZ7002RCZZ	MAIN PWB: X1 (8M)	270°/3sec.
	RCRMZ7004RCZZ	MAIN PWB: X2 (7.37M)	270°/3sec.

6. Note for handling of Touch panel

- The transparency of the touch panel should be vitally important. Do not put finger prints or water print on the surface. Use clean finger such or gloves and masks.
- For handling, do not hold the transparent are, and do not hold the heat seal connector section to assure reliability.
- Do not overlay touch panels. The edge may damage the surface.
- Do not put a heavy thing on the touch panel.
- Do not apply a strong shock, and do not drop it.
- When attaching the protection film again, carefully check for no dirt. If there is any dirt, it is transferred.
- To clean dirt on the surface, use dry, soft cloth or a cloth immersed in ethyl alcohol.
- Check that the housing does not give stress to the touch panel.
- Be careful not to touch the touch panel with tools.
- The heat seal section is easily disconnected. Be careful not to give a stress to the heat seal section when installing.
- The touch panel is provided with an air groove to make the external and the internal air pressure equal to each other. If water or oil is put around the air groove, it may penetrate inside. Be careful to keep the air groove away from water and oil.
- Input is performed with fingers. Do not use a hard thing for inputting.

7. Note for handling of LCD

- The LCD elements are made of glass. BE careful not to give them strong mechanical shock, or they may be broken. Use extreme care not to break them.
- If the LCD element is broken and the liquid is leaked, do not lick it. If the liquid is attached to your skin or cloth, immediately clean with soap.
- Use the unit under the rated conditions to prevent against damage.
- Be careful not to drop water or other liquid on the display surface.
- The reflection plate and the polarizing plate are easily scratched. BE careful not to touch them with a hard thing such as glass, tweezers. Never hit, push, or rub the surface with hard things.
- When installing the unit, be careful not to apply stress to the LCD module. If an excessive stress is applied, abnormal display or uneven color may result.

8. Cautions on handling connectors

When connecting or disconnecting the following connectors, follow the procedures below.

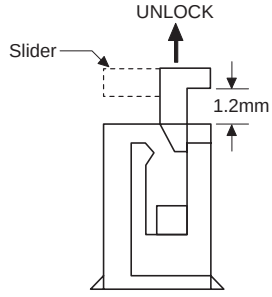
1)

PARTS NAME	PARTS CODE	LOCATION
FFC CONNECTOR	QCNCW7207RC4J	MAIN PWB: CN6 TOUCH PWB: CN5

- **How to Connect or Disconnect FFC**

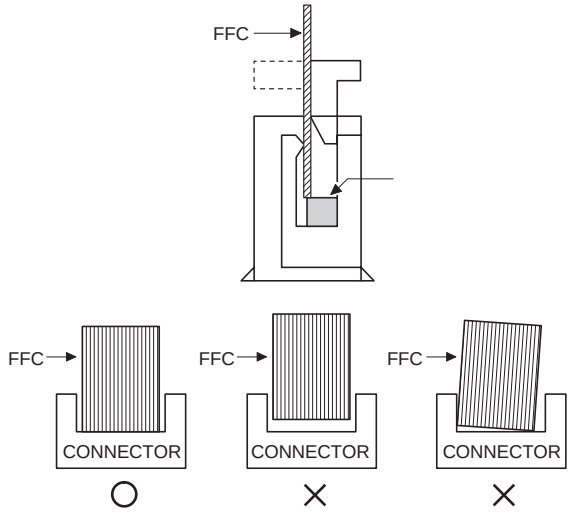
(1) Open the slider to unlock position

The slider will open only up to a fixed height (about 1.2mm). If you forcibly pull up the slider further, it may be dropped.



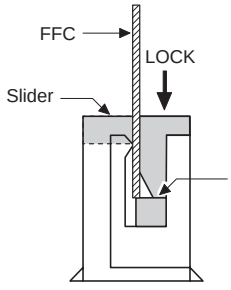
(2) Insert the FFC

Insert the FFC firmly untill the FFC hits the bottom of the connector's insulator.



(3) Close the slider to lock position

Insert the FFC and then push the slider downward.

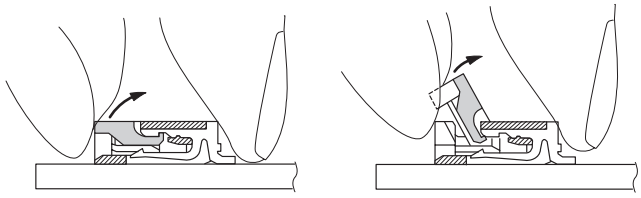


2)

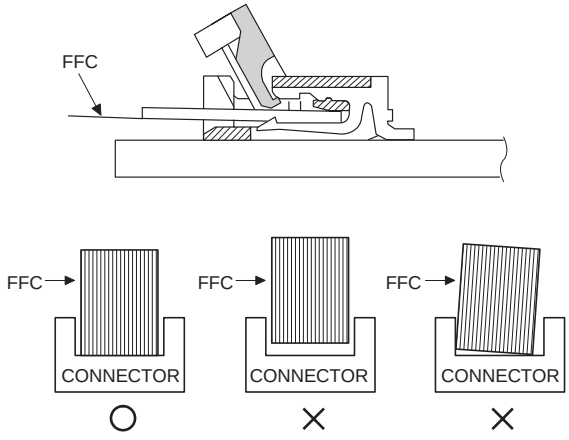
PARTS NAME	PARTS CODE	LOCATION
FFC CONNECTOR	QCNCW7217RC3J	TOUCH PWB: CN1

- **How to Insert FFC**

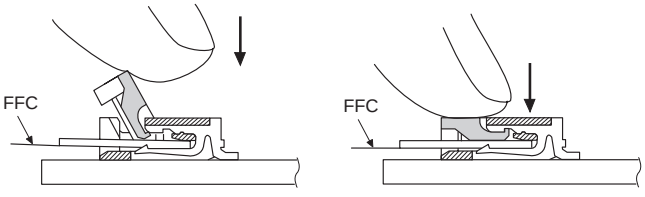
(1) Open the slider to unlock position
Open the slider upwards up to an angle of 60 degrees. If the slider does not fully open, the FFC can not be smoothly inserted.



(2) Insert the FFC
Insert the FFC firmly until the FFC hits the bottom of the connector's insulator.



(3) Close the slider to lock position
Insert the FFC and then push the slider downward.



(4) To pull out the FFC, unlock the slider to pull it out in the same procedures as (1).

9. Note for handling Rear Display PWB unit

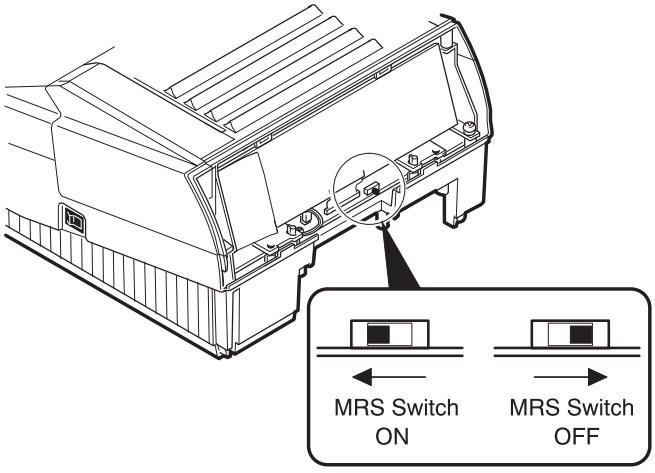
SYSTEM RESET is controlled by the battery-protected CKDC9 (1 chip microcomputer) on the rear display PWB. RESET control becomes impossible if the connection cable leading to the MAIN PWB.

Don't disconnect the CABLE when repairing and adding OPTION.

If it is needed to disconnect the CABLE or it is disconnected by mistake, connect again and carry out SRV RESET.

CHAPTER 4. PROGRAM RESET and SRV mode

In the UP-3300, the following reset switch (location No: S1) is used to switch to the service (SRV) mode and to reset.



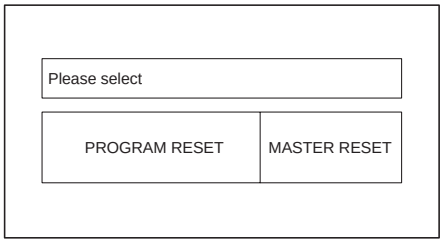
NOTE: Do not turn on the MRS switch with the main power supply switch turned ON; Otherwise data might be destroyed.

PROGRAM RESET

Used to return the machine back to its operation state after a lock up has occured.

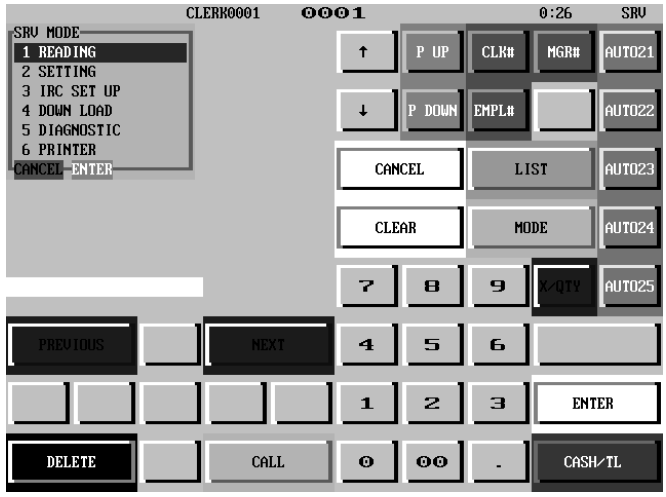
PROCEDURE

1) Turn off the AC switch.
2) Set the reset switch to "ON" position.
3) Turn on the AC switch.
4) Set the reset switch to "OFF" position.
5) The reset menu windowis displayed as shown below.
   DISPLAY:



   Touch the [PROGRAM RESET] key.
6) PROGRAM RESET is started.
7) After completion of the program reset, the SRV mode is displayed as shown below.
   DISPLAY:

[SRV mode screen]



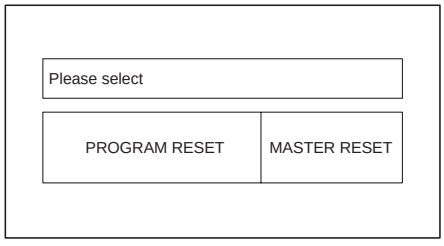
CHAPTER 5. MASTER RESET (All Memory Clear)

There are three possible methods to perform a master reset.

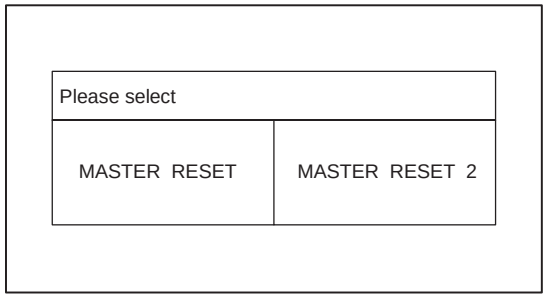
1. MRS-1 (Master resetting 1): Clear the entire memory and resumes initial values.

PROCEDURE

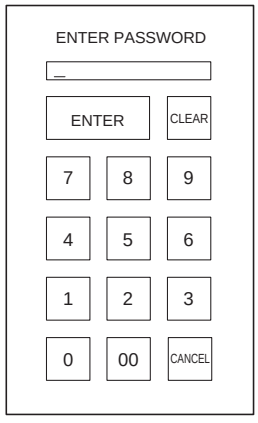
1) Turn off the AC switch.
2) Set the reset switch to "ON" position.
3) Turn on the AC switch.
4) Set the reset switch to "OFF" position.
5) The reset menu windowis displayed as shown below.
   DISPLAY:



   Touch the [MASTER RESET] key.
6) The master reset menu window is displayed as shown below.
   DISPLAY:



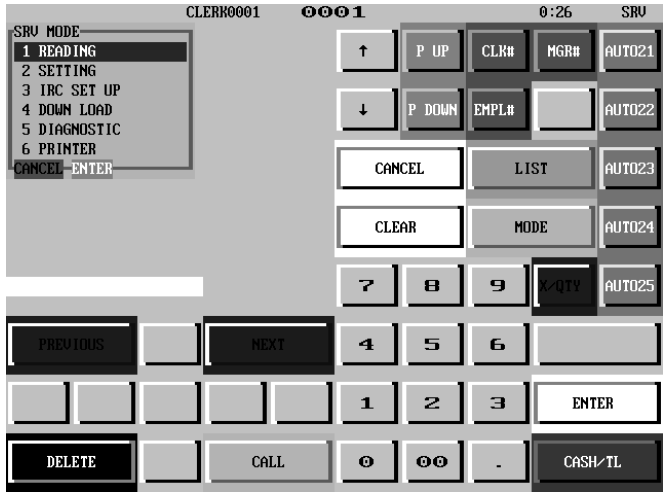
   Touch the [MASTER RESET] key.
7) The secret number input window is displayed as shown below.
   DISPLAY:



   Enter the secret number for the MASTER RESET-1 and touch the [ENTER] key.
   Secret number for MRS-1: 11111111
8) MASTER RESET-1 is started.
   DISPLAY:

9) After completion of the master reset, the buzzer sounds three times and the following SRV mode display is shown.
   DISPLAY:

[SRV mode screen]

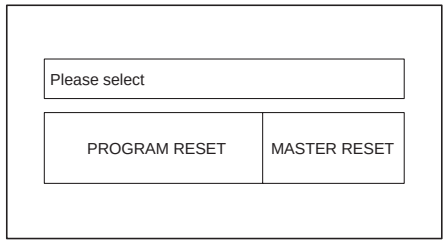


2. MRS-2 (Master resetting 2): Clear the entire memory and resumes initial values.

The keyboard must be entered by hand. This reset is used if an application needs different kyeboard layout other than that supplied by a normal MRS-1.

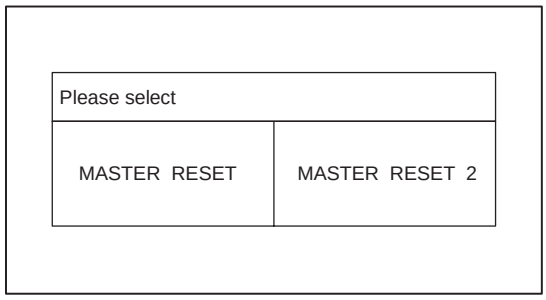
PROCEDURE

1) Turn off the AC switch.
2) Set the reset switch to "ON" position.
3) Turn on the AC switch.
4) Set the reset switch to "OFF" position.
5) The reset menu windowis displayed as shown below.
   DISPLAY:



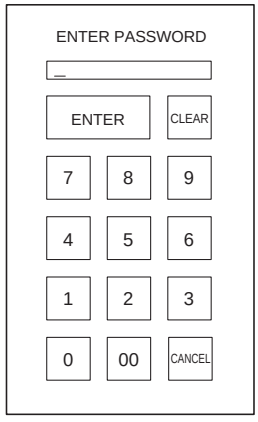
   Touch the [MASTER RESET] key.

6) The master reset menu window is displayed as shown below.
DISPLAY:



Touch the [MASTER RESET 2] key.

7) The secret number input window is displayed as shown below.
DISPLAY:



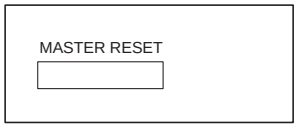
Enter the secret number for the MASTER RESET-2 and touch the [ENTER] key.

Secret number for MRS-2: 22222222

8) Set the fixed keys in the table below (Start from the [HOME] key, The key are displayed sequentially)
DISPLAY:

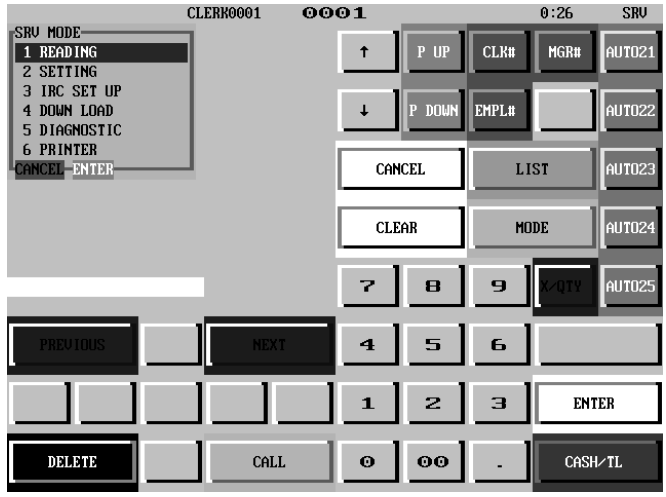
No.	KEY NAME
1	HOME
2	CANCEL
3	CL
4	MODE
5	UP (↑)
6	DOWN (↓)

9) MASTER RESET-2 is started.
DISPLAY:



10) After completion of the master reset, the buzzer sounds three times and the following SRV mode display is shown.
DISPLAY:

[SRV mode screen]



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   1) Loop Back Check 6-11
   2) Printer Print Check 6-11
   3-14. EFT (ER-02EF) Diagnostics 6-11
   1) Procedure 6-11
   2) Test 6-11
   3) End (display) 6-11

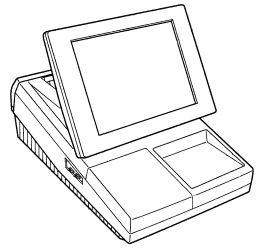
1. General

This diagnostics program is used for simplified checking of the UP-3300 series operations in servicing.
The diagnostics program is built in the standard ROM.

2. System configuration

2-1. Test system

UP-3300 only



3. Diagnostics

Starting the diagnostics

This diagnostics program is written in the external ROM and executed by the CPU (H8/510). To operate this program, the following conditions must be satisfied.

① The power for the logic system is proper.
(+5V, VRAM, VCKDC, POFF, +20V)

② The input/output pins and the internal logic of the CPU are normal. In addition, CKDC9, MPCA8, the system bus, and the standard ROM/RAM are normal.

Note: When booting the set for the first time after change the touch panel and EE-PROM, carry out TOUCH KEY CALIBRATION and MASTER RESETTING.

In order to add an option unit when the machine is normally operating, perform the program reset in the case of the ER-A7RS and a master reset in case of the UP-P02MB2.

1) Master reset procedure

① Turn off the power.

② Set the CKDC reset switch to RESET position.

③ Turn on the power.

④ While touching the touch panel, place the CKDC RESET SWITCH to normal position. (When both the touch panel and EE-ROM was replaced.)

⑤ Carry out CALIBRATION. (When both the touch panel and EE-ROM was replaced.)

⑥ Select MASTER RESET from the menu and execute.

2) Program reset (service reset) procedure

① Turn off the power.

② Set the CKDC reset switch to RESET position.

③ Turn on the power.

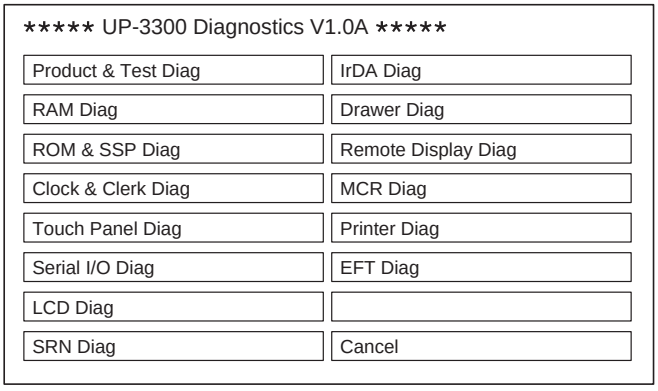
④ Set the CKDC reset switch to the normal position. (Do not press the touch panel.)

⑤ Select PROGRAM RESET from the menu and execute.

3-1. Execution of diagnostics

To start the diagnostics, select "DIAGNOSTICS" in the menu selection in SRV mode.

The DIAG MAIN MENU is started and the following menu screen is displayed. The selected individual diagnostics program is executed. When the individual diagnostics program is completed, the display returns to the menu screen. To terminate the diagnostics, press the CANCEL key. Then the display returns to the SRV mode menu screen.



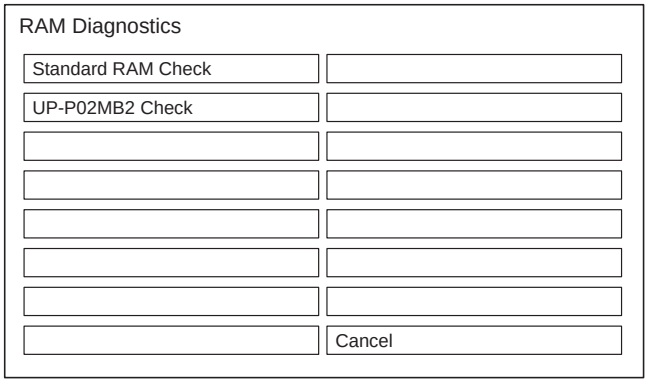
WARNING: "Product & Test Diagnostics" is used only in the production process, and must be not used in servicing.

3-2. RAM Diagnostics

This diagnostics is used to test the standard RAM and the expansion RAM.

The following menu is displayed. Press the touch key for the of the operation you want to execute to execute individual Diag programs.

Pressing the CANCEL key returns the screen to the Diag MAIN menu.



1) Standard RAM Check

① Check content

For the pseudo SRAM of the standard RAM 1MB, the following check is performed. The memory contents will not be changed by this check.

The following processes are performed for the memory address (700000H ~ 7FFFFFH) to be checked.

PASS1: Memory data save

PASS2: Data "0000H" write

PASS3: Data "0000H" read/compare, data "5555H" write

PASS4: Data "5555H" read/compare, data "AAAAH" write

PASS5: Data "AAAAH" read/compare

PASS6: Memory data writed the saved data

In case of a compare error in the check sequences of PASS1 ~ PASS6, an error display is made. If there is no error at all, the check is normally terminated.

In addition, the following address check is performed.

In case of an error, an error display is made and read/write of the address where the error occurred is repeated.

Check point address = 700000H, 700001H
700002H, 700004H
700008H, 700010H
700020H, 700040H
700080H, 700100H
700200H, 700400H
700800H, 701000H
702000H, 704000H
708000H, 710000H
720000H, 740000H
780000H

② Display

```
Standard RAM Check

  Standard memory size: 1024KB PASS!!(or ERROR!!)

  Error Address   xxxxxxH
      Write Data    xxxxH
       Read Data    xxxxH
```

The error address and the bit are displayed only when the error occurs. (If the error does not occur, the error address will not be displayed.)

③ Terminating procedure

After completion of check, press the Touch panel.

2) UP-P02MB2 Check

① Check content

The UP-P02MB2 presence check is performed in the following procedure. The memory contents will not be changed by this check.

- 55AAH is written into 9FFFFEH.
- 9FFFFEH is read and compared with 55AAH. If the both data are correct, the following procedure is performed. If not, "Extended RAM size: 0KB" is displayed and the check is terminated.

For the UP-P02MB2, the following check is performed.

The following processes are performed for the check address (800000H ~ 9FFFFFH).

PASS1: Memory data save

PASS2: Data "0000H" write

PASS3: Data "0000H" read/compare, data "5555H" write

PASS4: Data "5555H" read/compare, data "AAAAH" write

PASS5: Data "AAAAH" read/compare

PASS6: Memory data writed the saved data

In case of a compare error in the check sequences of PASS1 ~ PASS6, an error display is made. If there is no error at all, the check is normally terminated.

In addition, the following address check is performed in the above check sequence.

In case of an error, an error display is made and read/write of the address where the error occurred is repeated.

Check point address = 800000H, 800001H
800002H, 800004H
800008H, 800010H
800020H, 800040H
800080H, 800100H
800200H, 800400H
800800H, 801000H
802000H, 804000H
808000H, 810000H
820000H, 840000H
880000H, 900000H

② Display

```
UP-P02MB2 Check

   Extended RAM size : 2048KB  PASS!!(or ERROR!!)

   Error Address  xxxxxxH
       Write Data  xxxxH
        Read Data  xxxxH
```

The error address and the bit are displayed only when the error occurs. (If the error does not occur, the error address will not be displayed.)

③ Terminating procedure

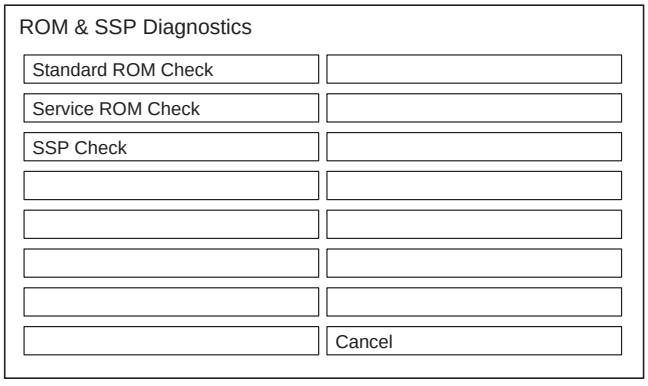
After completion of check, press the Touch panel.

3-3. ROM & SSP Diagnostics

The standard ROM and the service ROM are checked. The SSP circuit is also checked.

The following menu is displayed. Press the thouch key for of the operation you want to execute to execute individual Diag programs.

Pressing the CANCEL key returns the screen to the Diag MAIN menu.



1) Standard ROM Check

① Check contents

The standard ROM area (200000H ~ 3FFFFFH) is added in the unit of byte. If the lower two digits of the result is 20H, it is normal. The ROM version and the model name code which are stored in address 31FFE0H ~ 31FFFFH where the ROM version and the check sum correction data stored are displayed. The format of data (ASCII) to be stored is as follows:

31FFE0H ~ 31FFEFH: Model name code (example: UP-3300, Display is made up to 00H of data.)

31FFF0H ~ 31FFF9H: 27801R****(****=PROGRAM VERSION)

31FFFAH ~ 31FFFBH: BLOCK NO. ("20" ~ "3F")

31FFFCH: TERMINATOR ("=")

31FFFDH ~ 31FFFEH: BLOCK VERSION (example "00")

31FFFFH: CHECK SUM CORRECTION DATA

The flash ROM used as the standard ROM has rewriting block of 64KB as the unit. To control the version in each block, the composition is the same as the above 31FFF0H or later and arranged in each 64KByte. At that time, correction is made so that the sum of each block becomes 01H, and the total of 2MByte is 20H.

The FLASH write MASTER EPROM has changed from 8 Mbits to 2 chips so that the program version indication can be managed by each chip. The program version stored in the blocks of 21H and 31H is displayed.

The program version of the IPL is displayed so that 0PAGE where the IPL is stored is individually controlled.

② Display

```
Standard ROM Sum Check      : PASS!!(or ERROR!!)
IPL PROGRAM Version
                **
APL PROGRAM Version              ← Display the version.
        27801R****  UP-3300
        27801R****  UP-3300
BLOCK Version
 20=** 21=** 22=** 23=** 24=** 25=** 26=** 27=**
 28=** 29=** 2A=** 2B=** 2C=** 2D=** 2E=** 2F=**
 30=** 31=** 32=** 33=** 34=** 35=** 36=** 37=**
 38=** 39=** 3A=** 3B=** 3C=** 3D=** 3E=** 3F=**
```

③ Terminating procedure

After displaying the check result, press the Touch panel to terminate the check.

2) SERVICE ROM Check

Note: This check should only be performed will be using the service ROM.

① Check content

The standard ROM (EPROM × 2 Chip) area (D00000H ~ EFFFFFH) is added in the unit of byte. If the lower two digits of the result is 10H, it is normal. The ROM version and the model name code which are stored in address D1FFE0H ~ D1FFFFH where the ROM version and the check sum correction data are stored are displayed. The format of data (ASCII) to be stored is as follows:

D1FFE0H ~ D1FFEFH: Model name code (example: UP-3300. Display is made up to 00H of data.)

D1FFF0H ~ D1FFF9H: 27801R****(****=PROGRAM VERSION)

D1FFFAH ~ D1FFFBH: BLOCK NO. ("20" ~ "2F")

D1FFFCH: TERMINATOR ("=")

D1FFFDH ~ D1FFFEH: BLOCK VERSION (example "00")

D1FFFFH: CHECK SUM CORRECTION DATA

This SERVICE ROM allows to write into the FLASH ROM when re-execution is impossible because of an abnormality during rewriting into the FLASH ROM. The composition is the same as the standard ROM.

The program version of the IPL is displayed so that 0PAGE where the IPL is stored is individually controlled.

② Display

```
Service ROM Sum Check 1 : PASS!!(or ERROR!!)
Service ROM Sum Check 2 : PASS!!(or ERROR!!)
IPL PROGRAM Version
                **              ← Display the version.
APL PROGRAM Version
        27801R****  UP-3300
        27801R****  UP-3300
BLOCK Version
 20=** 21=** 22=** 23=** 24=** 25=** 26=** 27=**
 28=** 29=** 2A=** 2B=** 2C=** 2D=** 2E=** 2F=**
            :
```

③ Terminating procedure

After displaying the check result, press the Touch panel to terminate the check.

3) SSP Check

① Check content

By starting this check program, the SSP setting for checking is automatically performed and the SSP check is executed and the result is displayed.

The SSP check sets data for checking in the vacant space of the SSP entry register, and deletes the data that is checked after completion of checking. Therefore, the already set data is not changed by this check.

② Display

```
SSP Check

   SSP (NMI) Check          : PASS!!(ERROR!!)
```

③ Terminating procedure

After displaying the check result, press the Touch panel to terminate the check.

3-4. Timer & Clerk switch Diagnostics

The operation of the clock crystal of CKDC, and the keyboard are tested.

When the CANCEL key is pressed, the display returns to the diagnostics menu.

1) Timer & Clerk switch Check

① Check

The operation of the CKDC9 clock crystal and clerk key code are checked.

The indication "YY/MM/DD & MM:HH:SS" is continuously updated. Check the time updated and indicated.

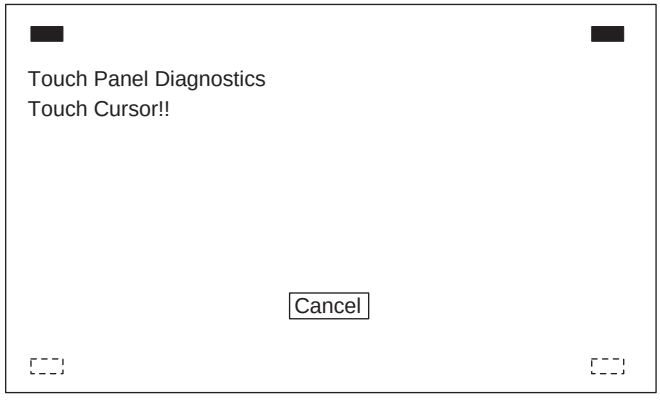
```
Timer Diagnostics
   DATE & TIMER = YY/MM/DD & HH:MM:SS
   CLERK CODE = ***
```

3-5 Touch Panel Diagnostics

1) Touch Panel Check

① Check

The input test of the touch panel is as follows: a rectangle of dotted lines is displayed at the corner of the LCD screen in the order of upper right, upper left, lower left, and lower right. Check whether a catch sound is heard and the square turns black when each position is touched.



② End

The test is over when the four corners have been touched. To exit, please press the touch panel.

3-6. RS232 I/F Diagnostics

The main PWB and the option PWB (RS232 interface of ER-A7RS) are checked. Attach the 9-pin D-Sub loop back connector (UKOG-6717RCZZ) of wiring in Fig. 3-11.

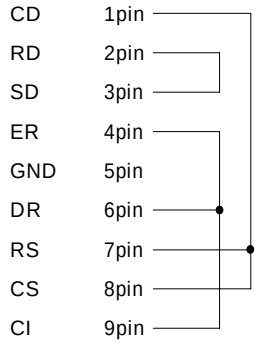


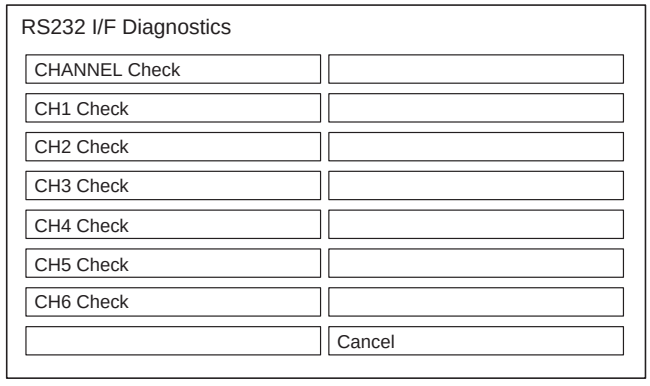
Fig. 3-11. Wiring diagram of loop back connector (UKOG-6717RCZZ)

The following menu is displayed. Press the touch key for the operation you want to execute to execute individual Diag programs.

Pressing the CANCEL key returns the screen to the Diag MAIN menu.

IMPORTANT

When setting channels of RS232, do not set two or more ports to one channel. In the UP-3300, max. two units of ER-A7RS can be installed. In each PWB, do not set two or more ports to the same channel. If two or more ports should be set to the same channel, the hardware can be destroyed.



1) CHANNEL Check

① Check content

The CHANNEL setting of the connected RS232 is displayed. The display content and the setting of DIP SW for CHANNEL setting on the RS232 I/F PWB are compared.

Since the RS232 and printer port on the main PWB of the UP-3300 is fixed to CH1, CH2 and CH7, that in the ER-A7RS must be set to CH3 ~ CH6.

```
RS232 I/F Diagnostics

   CHANNEL Check
   CH1 = exist!     ← Display when channel present
   CH2 = exist!
   CH3 = none!      ← Display when no channel
   CH4 = none!
   CH5 = none!
   CH6 = none!
   CH7 = exist!
```

(Reference) ER-A7RS CHANNEL setting (In the table below, "1" = SW OFF, "0" = SW ON.)

ER-A7RS CON3

S1-1	S1-2	S1-3	CHANNEL
0	0	0	Invalid
0	0	1	CHANNEL 1: Do not set this (Reserved for standard RS)
0	1	0	CHANNEL 2: Do not set this (Reserved for standard RS)
0	1	1	CHANNEL 3
1	0	0	CHANNEL 4
1	0	1	CHANNEL 5
1	1	0	CHANNEL 6
1	1	1	CHANNEL 7: Do not set this (Reserved for internal printer)

ER-A7RS CON4

S1-4	S1-5	S1-6	CHANNEL
0	0	0	Invalid
0	0	1	CHANNEL 1: Do not set this (Reserved for standard RS)
0	1	0	CHANNEL 2: Do not set this (Reserved for standard RS)
0	1	1	CHANNEL 3
1	0	0	CHANNEL 4
1	0	1	CHANNEL 5
1	1	0	CHANNEL 6
1	1	1	CHANNEL 7: Do not set this (Reserved for internal printer)

② Terminating procedure

Press the Touch panel to terminate the check.

2) CH1 Check

① Check content

When the channel is not set, an error display is made (ERROR:CH1). When the channel is set, the following check is performed.

- Control signal check

ERn	RSn	DRn	CIn	CDn	CSn
OFF	OFF	OFF	OFF	OFF	OFF
OFF	ON	OFF	OFF	ON	ON
ON	OFF	ON	ON	OFF	OFF
ON	ON	ON	ON	ON	ON

The read check of the above inputs and the interruption check of CS, CI, and CD are performed.

In the read check, ER and RS are changed over in the above sequence and the logic states of DR, CI, CD, and CS are checked.

If the logic differs from that in the table, an error display is made.

"ON" in the table means Active LOW, and "OFF" means Active HIGH.

In the interruption check, an interruption of CS, CI, or CD is allowed one by one. (MASK is canceled.)

If an interruption is not made when each signal is active, or if an interruption is made when each signal is not active, an error display is made.

The above check is repeated four cycles.

- Data transfer check

  The loop back data (256 bytes) of 00H ~ 0FFH are used for data transfer check. The baud rate is set to 38400BPS.

- Timer check (RS232 on board timer)

  Before performing the check, set the timer to TCVDT start and 5ms. Then perform the following procedure.

  ∗ During execution of the check, TRQ- must not be generated.

  ∗ After 5ms from completion of the check, TRQ- must be generated.

② Display

```
RS232 CH1 Check

ER-DR          :     ERROR!!
```

All the contents of an error must be displayed.

ERROR No.	ERROR display	ERROR content
1	ER-DR:ERROR	ER-DR LOOP ERROR
2	ER-CI:ERROR	ER-CI LOOP ERROR
3	RS-CD:ERROR	RS-CD LOOP ERROR
4	RS-CS:ERROR	RS-CS LOOP ERROR
5	CI INT:ERROR	CI interruption is not made.
6	CD INT:ERROR	CD interruption is not made.
7	CS INT:ERROR	CS interruption is not made.
8	TXEMP:ERROR	TXEMP is not set.
9	TXEMP INT:ERROR	TXEMP interruption is not made.
10	TXRDY:ERROR	TXRDY interruption is not made.
11	TXRDY INT:ERROR	TXRDY interruption is not made.
12	RCVRDY:ERROR	RCVRDY is not set. (Reception enabled. TR-Q is generated during check)
13	RCVRDY INT:ERROR	RCVRDY interruption is not made.
14	SD-RD:ERROR	SD-RD LOOP ERROR (DATA ERROR)
15	SD-RD:ERROR	SD-RD LOOP ERROR (DATA ERROR, FRAMING ERROR, etc.)
16	TIMER:ERROR	TIMER ERROR (TMRQ is not set after completion of check.)
17	TIMER INT:ERROR	TRQ-1 interruption is not made.

③ Terminating procedure

Press the Touch panel to terminate the check.

3) CH2 Check

① Check content

The check procedure, the display, and the terminating procedure are the same as CH1 Check.

4) CH3 Check

① Check content

The check procedure, the display, and the terminating procedure are the same as CH1 Check.

5) CH4 Check

① Check content

The check procedure, the display, and the terminating procedure are the same as CH1 Check.

6) CH5 Check

① Check content

The check procedure, the display, and the terminating procedure are the same as CH1 Check.

7) CH6 Check

① Check content

The check procedure, the display, and the terminating procedure are the same as CH1 Check.

3-7. Liquid Crystal Display Diagnostics

The UP-3300 LCD display is checked.

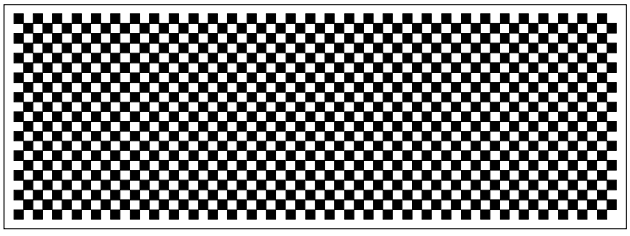
The test program displays the patterns in the following sequence. Every time when the Touch panel is pressed, the next pattern is displayed. When the Touch panel is pressed at the final pattern the display returns to the menu screen.

1) Liquid Crystal Display Check

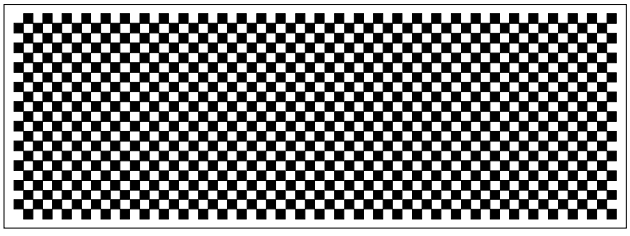
① Check content

The test patterns are displayed in the following sequence. When the Touch panel is pressed, the next pattern is displayed.

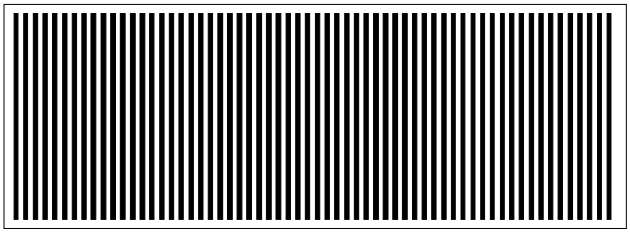
i. Black and white pattern at 1 dot pitch



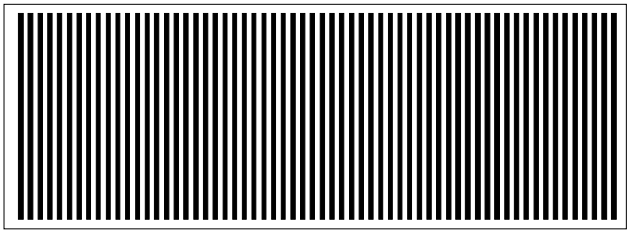
ii. Reversed pattern of the above (i)



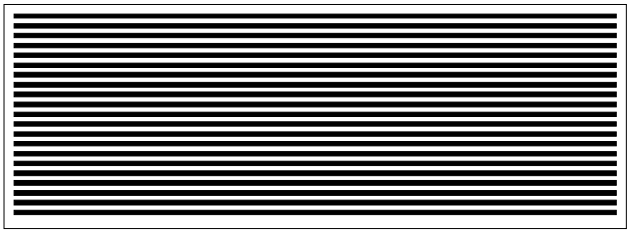
iii. Vertical stripe pattern at 1 dot pitch



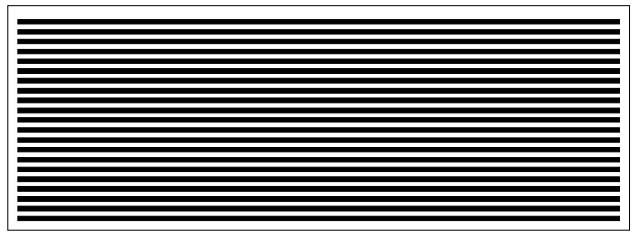
iv. Reversed pattern of the above (iii)



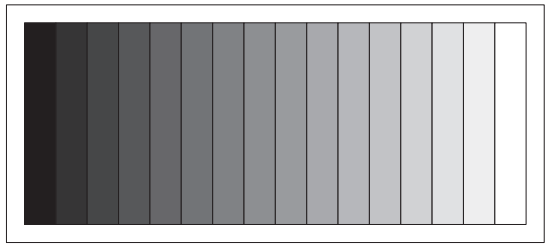
v. Horizontal stripe pattern at 1 dot pitch



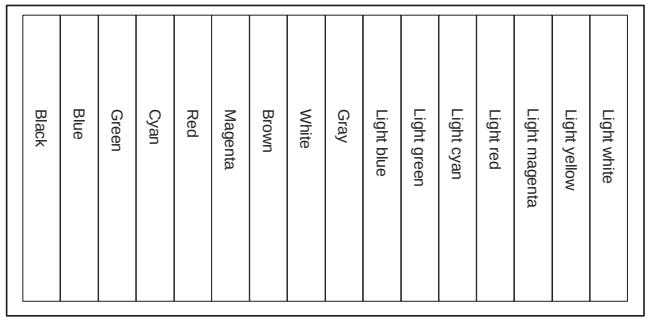
vi. Reversed pattern of the above (v)



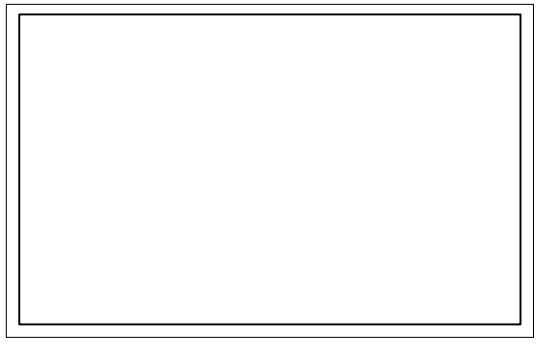
vii. Sixteen patterns of gradation ranging from black to white are displayed from left to right of the screen.



viii. 16-color bars are displayed.
from left: black, blue, green, cyan, red, magenta, brown, white, gray, light blue, light green, light cyan, light red, light magenta, light yellow, and light white

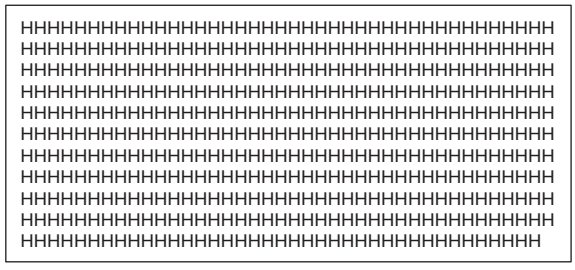


ix. The outermost peripheral of the LCD's active area is displayed in one-dot line.



White rester test

x. "H" pattern. "H" is displayed in 80 digits and 25 lines. The 15th line only has 39 digits of "H."



③ Terminating procedure

Press the Touch panel at the final pattern, or press the CANCEL key to terminate the check.

3-8. Remote Display Diagnostics

The remote display (UP-P16DP) is checked.

The test program displays the following patterns. When the Touch panel is pressed, the display returns to the diagnostics menu.

1) Remote Display Check

① Check content

The test patterns are displayed in the following sequence. When the Touch panel is pressed, the next pattern is displayed.

i. The test pattern below is displayed.

ALPHA DISPLAY: 0 1 2 3 4 5 6 7 8 9 ; A a B b c

7-SEG DISPLAY: 0. 1. 2. 3. 4. 5. 6. 7. 8. 9. -.

▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼

ii. The test pattern with all the elements ON is displayed.

ALPHA DISPLAY: ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■

7-SEG DISPLAY: 8. 8. 8. 8. 8. 8. 8. 8. 8. 8. 8.

▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼

② Display

```
Remote Display Check
```

③ Terminating procedure

Press the Touch panel to turn off all the elements of the remote display.

3-9. SHARP Retail Network Diagnostics

The SRN test is performed.

To perform this test, the following composition is required.

- UP-3300
- Terminal resistor
- Branch (trunk) cable (only for data transfer test)

The following menu is displayed. Press the touch key for of the operation you want to execute to execute individual Diag programs.

Pressing the CANCEL key returns the screen to the Diag MAIN menu.

SRN Diagnostics

Self Check	
Flag Check (need of SRV reset!)	
Data Check (need of SRV reset!)	
Data Check (Satellite Machine)	
Data Check (Master Machine)	
	Cancel

1) SRN Self Check

① Check content

The ROM and RAM for SRN are checked, and CTC interruption and carrier sense are checked. Also ADLC function and transmission/reception DMA check is made by using the self loop function of ADLC (MC6854). In addition, the other signals are checked. The check procedure is as follows:

- Execute diagnostics command 2. The number of resending is displayed.
- Execute diagnostics command 0. The error status is displayed. The error status is as shown in the table below. When an error occurs in this test, the following tests are not performed.

b7	An error occurs. (The error print is always 1.)
b6	An unexpected interruption is made.
b5	A collision is generated.
b4	An interruption of send complete cannot be made. (DMAC TC UP interruption)
b3	An interruption of carrier OFF cannot be made. The mirror image of carrier OFF shows carrier ON.
b2	An interruption of CTC CH2 or CH3 cannot be made. (Timer interruption)
b1	ROM sum check error
b0	TAM error

- Execute diagnostics command 1. The error status is displayed. The error status is as shown in the table below.

b7	An error is generated. (The error print is always 1.)
b6	An unexpected interruption is generated.
b5	DMA sent data and received data are different.
b4	The number of data received in DMA is abnormal.
b3	The number of data transmitted in DMA is abnormal.
b2	An overrun error is generated.
b1	An underrun error is generated.
b0	An interruption of send complete cannot be made. (DMAC TC UP interruption)

- Execute diagnostics command 5. The error status is displayed. The names and the directions of the signals which are subject to diagnostics 5 command are as shown in the table below.

Signal name	Direction
Power interruption notice	Host → Controller
Power interruption ON initialization	Host → Controller
Power interruption ON continuation	Host → Controller
Power interruption process complete	Host ← Controller
CH1 reception data present.	Host ← Controller
CH2 reception data present.	Host ← Controller

Check that the target bit of two statuses obtained by diagnostics 5 command is "0" for ST1 and "1" for ST2. (The other bits must be masked.) In the other cases, the error status is displayed with the error occurrence bit as "1." The normal bit shows "0."

The error status from the host to the controller is as shown in the table below.

b7	Not used. ("0" is always displayed.)
b6	Power interruption notice
b5	Not used. ("0" is always displayed.)
b4	Not used. ("0" is always displayed.)
b3	Not used. ("0" is always displayed.)
b2	Not used. ("0" is always displayed.)
b1	Power ON continuation
b0	Power ON initializing

The error status from the controller to the host is as shown in the table below.

b7	Not used. ("0" is always displayed.)
b6	Power interruption notice
b5	Not used. ("0" is always displayed.)
b4	CH2 reception data exits.
b3	CH1 reception data exits.
b2	Power interruption process complete
b1	Not used. ("0" is always displayed.)
b0	Not used. ("0" is always displayed.)

② Display

```
SRN Self Check
   DATA RETRY CNT.=xxx
   ACK  RETRY CNT.=xxx
   DIAG 0        :xxxxxxxx
   DIAG 1        :xxxxxxxx
   DIAG 5 H→C    :xxxxxxxx
   DIAG 5 H←C    :xxxxxxxx
```

The number of resending is displayed in xxx with a decimal number.

In the sequence of b7, b6, ..., b0 from the left. "1" is displayed in case of an error, and "0" when normal.

In the sequence of b7, b6, ..., b0 from the left. "1" is displayed in case of an error, and "0" when normal.

In the sequence of b7, b6, ..., b0 from the left. "1" is displayed in case of an error, and "0" when normal.

In the sequence of b7, b6, ..., b0 from the left. "1" is displayed in case of an error, and "0" when normal.

③ Terminating procedure

Perform the service reset.

2) SRN Flag Send Check

① Check content

Execute diagnostics 3 command to send Flag (7EH) continuously.

② Display

```
SRN Flag Send Check
```

③ Terminating procedure

Perform the service reset.

3) SRN Data Send Check

① Check content

Execute diagnostics 4 command to send data of 00H ~ FFH (256Byte) as one packet at 12.8msec packet interval at 1Mbps continuously.

② Display

```
SRN Data Send Check
```

③ Terminating procedure

Perform the service reset.

4) Data Transmission Check

Data transmission is checked in an actually composed system. The system is composed of one master machine and max. 15 satellite machines.

Note for starting the check

- When checking the set in which the SRN setting has been made, cancel the SRN setting before starting this check.
- When checking the actually composed system, disconnect the SRN cables of the sets which are not checked, or cancel the SRN setting. If it is set to "SRN exits," data may be destroyed.
- The transmission check setting must be performed after canceling the SRN setting of all the sets in the system. First, set the satellite machines, then set the master machine.

① Setting procedure

- Satellite machine setting

  In the menu screen, select "Data Transmission Check (Satellite)."

  The display is as follows:

```
Data Transmission Check (Satellite)

   Input Terminal Number  :
```

Enter the terminal No. (000 ~ 015) of the machine to be checked and press the Touch panel. The display is as shown below.

```
Data Transmission Check (Satellite)

   Input Terminal Number : xxx
   Data Sequence Number  : 0000
```

– The entered terminal No. is displayed.

- Master machine setting

  In the menu screen, select "Data Transmission Check (Master Machine)." The display is as shown below.

```
Data Transmission Check (Master)

   Input Master Terminal Number  :
```

Enter the terminal No. (000 ~ 015) of the machine to be checked and press the Touch panel. The display is as shown below.

```
Data Transmission Check (Master)

   Input Master Terminal Number    :xxx
   Input Satellite Terminal Number:
```

– The entered terminal No. is displayed.

Enter the terminal No. (000 ~ 015) of the machine to be connected to the machine to be checked and press the ENTER key. The display is as shown below.

```
Data Transmission Check (Master)

   Input Master Terminal Number    :xxx
   Input Satellite Terminal Number:xxx
```

– The entered terminal No. of satellite machine is displayed.

When checking with two or more satellite machines connected, enter the terminal No. (000 ~ 015) and press the ENTER key for each satellite connected. To execute, press the ENTER key without entering the terminal No. The display is as shown below. Do not use the same terminal No. for different machines (master/satellite).

```
Data Transmission Check (Master)

   Input Master Terminal Number    : xxx
   Input Satellite Terminal Number : xxx
   xxx xxx xxx xxx xxx

   Data Sequence Number            : 0000
```

With the above setting, data transmission between the master machine and the satellite machine is started.

② Check content

- Data in the following format composed of 2byte sequence No. and 254byte AAH data are transmitted from the master machine to the satellite machine. The master machine displays the sequence No.

Test data format (1 packet = 256byte)

1	2	3	4	5	···	···	···	254	255	256	Byte
XX	XX	AA	AA	AA	···	···	···	AA	AA	AA	

XXXX : Sequence No. (2byte: 4digits of binary decimal numbers)
AA : Transmission data (AAH) x 254 bytes

- The satellite machine sends back the received data to the master machine. The satellite machine displays the received sequence No.
- The master machine receives the data, and checks the sequence No. and 256byte AAH data. In case of an error, the master machine displays an error code and terminates the check. If two or more satellite machines are used, the above operation is repeated. If data transmission with all the satellite machines are normally completed, the master machine increments the sequence No.

The above operation is repeated.

③ Error display

```
Data Transmission Check (Master)

  Input Master Terminal Number    : xxx
  Input Satellite Terminal Number : xxx
  xxx xxx xxx xxx xxx

  Data Sequence Number            : xxxx
  IRC Error                       : xx —  The error code is displayed.
```

The error codes are as shown below.

01	Command abnormality (except for during transmission)
02	No data received.
03	Received data present. Received data remained.
04	Remote station not ready (in sending) "NTDY" is sent back because the remote station is not ready for reception.
05	Reception buffer full (in sending) The controller reception buffer of the remote machine is full.
06	Resend error (in sending) Retry over (5 times) when no response
07	Collision error (in sending) When an collision occurred in data transmission, retry over (16 times) at re-collision after a random time (0 ~ 255ms).
08	Line busy time out Transmission cannot be made by multi-station communication to cause time out in data send wait time.
09	Reception size over (in receiving) The reception buffer size is insufficient.
0A	Hardware error Interface abnormality (No SRN interface or abnormality in SRN controller)

③ Terminating procedure

Press the Touch panel to terminate the check.

3-10. IrDA & ASK Diagnostics

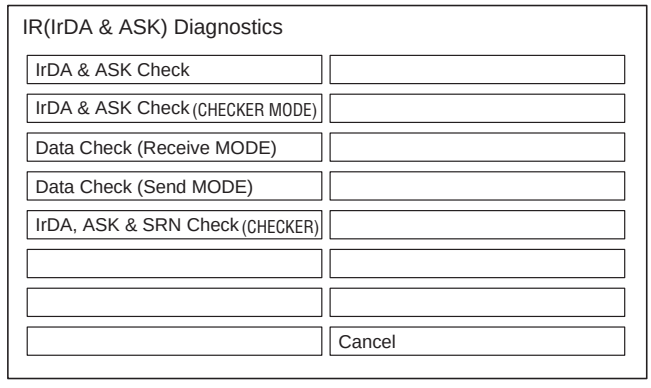
This is used to check the IR communication.

To execute this check, the following composition is required.

- UP-3300
- UP-3300 as checker

The following menu is displayed. Press the touch key for the operation you want to execute to execute individual Diag programs.

Pressing the CANCEL key returns the screen to the Diag MAIN menu.


IR(IrDA & ASK) Diagnostics
IrDA & ASK Check
IrDA & ASK Check (CHECKER MODE)
Data Check (Receive MODE)
Data Check (Send MODE)
IrDA, ASK & SRN Check (CHECKER)
Cancel

CAUTION: IrDA, ASK & SRN check (CHECKER) is used only in the production process, and must be not used in servicing.

1) IrDA & ASK Check

IR communication is checked between the UP-3300 sending unit and the receiving unit.

① Check content

- Data transmission is made from the machine to be checked in ASK format. The transmission rate is 9600bps. Data of 00H, 11H, 22H, 33H, 44H, 55H, 66H, 77H, 88H, 99H, AAH, BBH, CCH, EEH, and FFH are transmitted.
- The checker machine sends back the received data.
- The machine to be checked compares the data sent back and the data transmitted first. If both data are the same, it displays "PASS !!," and if not the same, "ERROR !!."
- Data transmission is made from the machine to be checked in IrDA format. The transmission rate is 9600bps. Data of 00H, 11H, 22H, 33H, 44H, 55H, 66H, 77H, 88H, 99H, AAH, BBH, CCH, EEH, and FFH are transmitted.
- The checker machine sends back the received data.
- The machine to be checked compares the data sent back and the data transmitted first. If both data are the same, it displays "PASS !!," and if not the same, "ERROR !!."

② Display

```
IrDA & ASK Check

ASK DATA (or TIMEOUT)  :  PASS!!(or ERROR!!)
IrDA DATA (or TIMEOUT) :  PASS!!(or ERROR!!)
```

③ Terminating procedure

Press the Touch panel to terminate the check.

2) IrDA & ASK Check (checker mode)

Set the checker machine (UP-3300) corresponding to the above check content (1).

② Display

```
IrDA & ASK Check (CHECKER MODE)

ASK DATA (or TIMEOUT)  :  PASS!!(or ERROR!!)
IrDA DATA (or TIMEOUT) :  PASS!!(or ERROR!!)
```

③ Terminating procedure

Press the Touch panel to terminate the check.

3) Data Transmission Check (Receive mode)

① Check content

Continuous IR communication between the UP-3300 and the UP-3300. This mode is on the reception side. When data of 256byte (00H ~ 0FFH) are received, the data packet counter is incremented by one. Check that the counter increments.

② Display

```
Data Transmission Check (Receive MODE)

COUNTER : **** (The RING COUNTER (0~9999) is displayed.)
```

③ Terminating procedure

Press the Touch panel to terminate the check.

4) Data Transmission Check (Send mode)

① Check content

Continuous IR communication between the UP-3300 and the UP-3300. This mode is on the transmission side. When data of 256byte (00H ~ 0FFH) are transmitted, the data packet counter is incremented by one. Check that the counter increments.

② Display

```
Data Transmission Check (Send MODE)
COUNTER : **** (The RING COUNTER (0~9999) is displayed.)
```

③ Terminating procedure

Press the Touch panel to terminate the check.

3-11. Magnetic Card Reader Diagnostics

Read check of the optional UP-E12MR2 is performed.

The test program reads the magnetic card of ISO 7811/1-5 standard and displays the data. When the Touch panel is pressed, the display returns to the diagnostics menu.

1) Magnetic Card Reader Check

① Check content

The test program reads tracks 1 and 2 of the magnetic card of ISO 7811/1-5, and displays the data in ASCII code.

② Display

```
  MCR (Magnetic Card Reader) Check

    TRACK1:
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
    TRACK2:
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
```

XXXXX shows the data read by the MCR. Incase of an error, the error code is displayed as shown below.

```
Magnetic Card Reader Check

   TRACK1:BUFFER EMPTY  – Displayed when TRACK1 empty
                          code is sent back.
   TRACK1:MCR ERROR     – Displayed when TRACK1 error
                          code is sent back.
   TRACK2:BUFFER EMPTY  – Displayed when TRACK2 empty
                          code is sent back
   TRACK2:MCR ERROR     – Displayed when TRACK2 error
                          code is sent back.
```

③ Terminating procedure

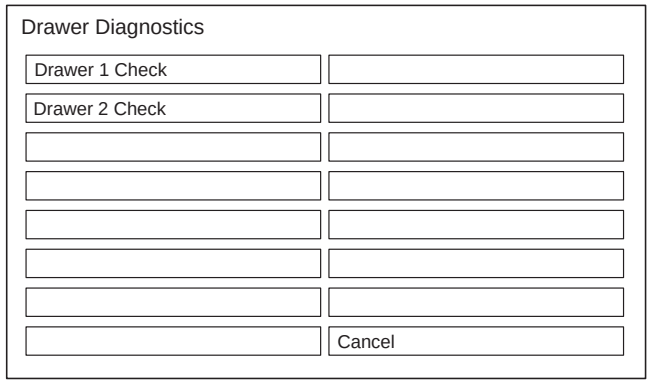
Press the Touch panel to terminate the check.

3-12. Drawer Diagnostics

This diagnostics is used to check the drawer open and sensors.

The following menu is displayed. Press the position of the operation you want to execute to execute individual Diag programs.

Pressing the CANCEL key returns the screen to the Diag MAIN menu.



1) Drawer 1 Check

① Check content

The solenoid of drawer 1 is turned on, and the drawer open sensor value is sensed at every 100ms, and the state is displayed.

② Display

```
Drawer 1 Check
   Drawer Open Sensor  :  OPEN (or CLOSE)
```

③ Terminating procedure

Press the Touch panel to terminate the check.

2) Drawer 2 Check

① Check content

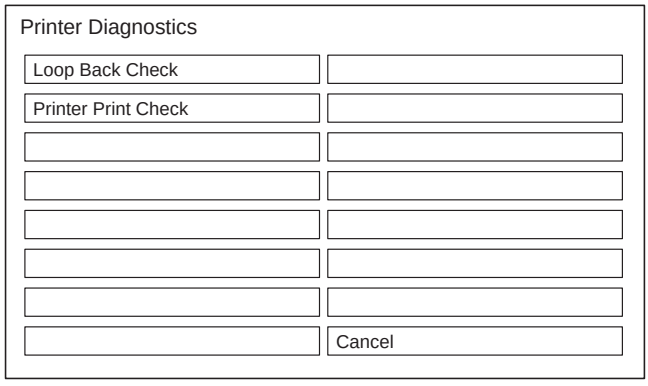
The solenoid of drawer 2 is turned on, and the drawer open sensor value is sensed at every 100ms, and the state is displayed.

The display and the terminating procedure are the same as Drawer 1 Check.

3-13 Printer Diagnostics

I/F loopback and printing tests of the printer are performed.

The following menu appears. Press the name of the test you want to perform to execute its Diag program. When the Diag program is terminated, the screen returns to the Printer Diagnostics menu. Pressing the CANCEL key returns to screen to the Diag Menu.



1) Loop Back Check

① Check

A LOOPBACK test on the built-in printer (UP-T80BP) interface (logic channel 7 of RS232) is performed and the result is displayed. The test itself is the same as that for the RS232. The difference in test specifications is as follows: The loopback signals are for ER-DR, RS-CS, TXD-RXD only and the following LOOPBACK-Connectors are required.

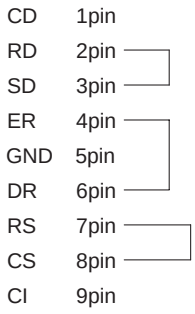


Fig.3-11. Wiring diagram of loopback connectors (UKOG-2356BHZZ)

② Indication

The indication is the same as that for RS232 DIAGNOSTICS.

③ End

Press the PANEL to end the program.

2) Printer Print Check

① Check

Send the signal to generate a receipt (by DIAG COMMAND) to the UP-T80BP.

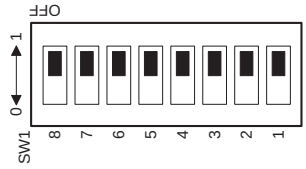
3-14. EFT (ER-02EF) Diagnostics

1) Procedure

① Select "EFT Diag" in the DIAG MAIN MENU.

② Power off.

③ The EFT starts up automatically by setting the whole 8-pin DIP switch SW1 to OFF and then turning the main power switch ON.



2) Test

When powering up the EFT, the loop-back test of EFT CN's ER-DR, ER-CI, and RS-CS is performed automatically.

Check the switch by turning on switch 1 to 8 of SW1 one by one. Then, perform the sum check test of EFT ROM and the write/read check of RAM.

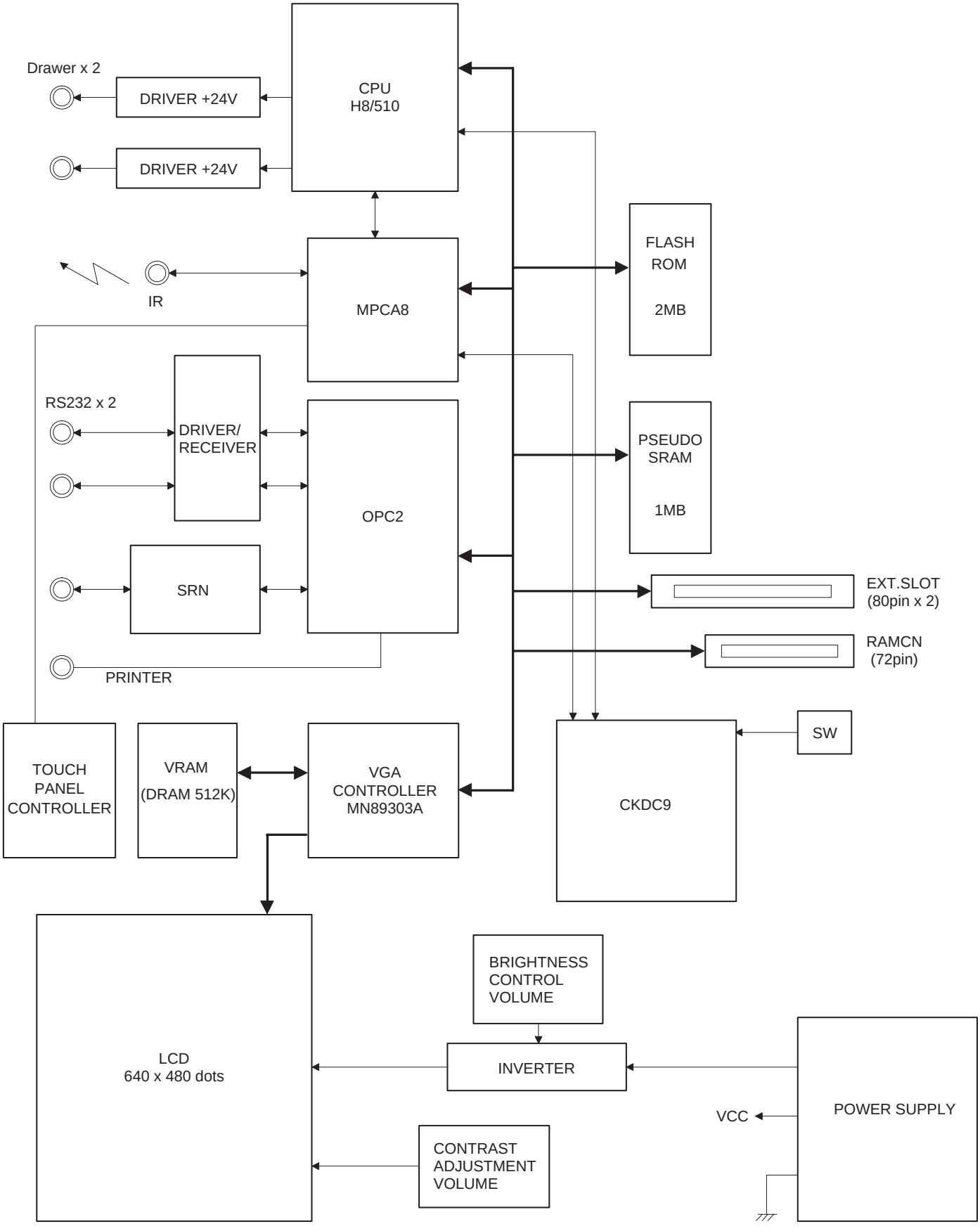
Perform the same test as JOB300 for address 0000H, 0001H, 0002H, 0004H, 0008H, 0010H, 0020H, 0040H, 0080H, 0100H, 0200H, 0400H, 0800H, 1000H, 2000H, and 4000H of RAM.

3) End (display)

Normal end	DIAG0 (SELF TEST)	: OK
	VHI27040R**1*	: OK
	256K SRAM	: OK
Error end	In Loop Back Error	
	ER-DR LOOP ERROR	
	ER-CI LOOP ERROR	
	RS-CS LOOP ERROR	
	In Self Test Error	
	DIP SW ERROR	
	In ROM/RAM Error	
	VHI27040R**1*	: ERROR
	256K SRAM	: ERROR

CHAPTER 7. CIRCUIT DESCRIPTION

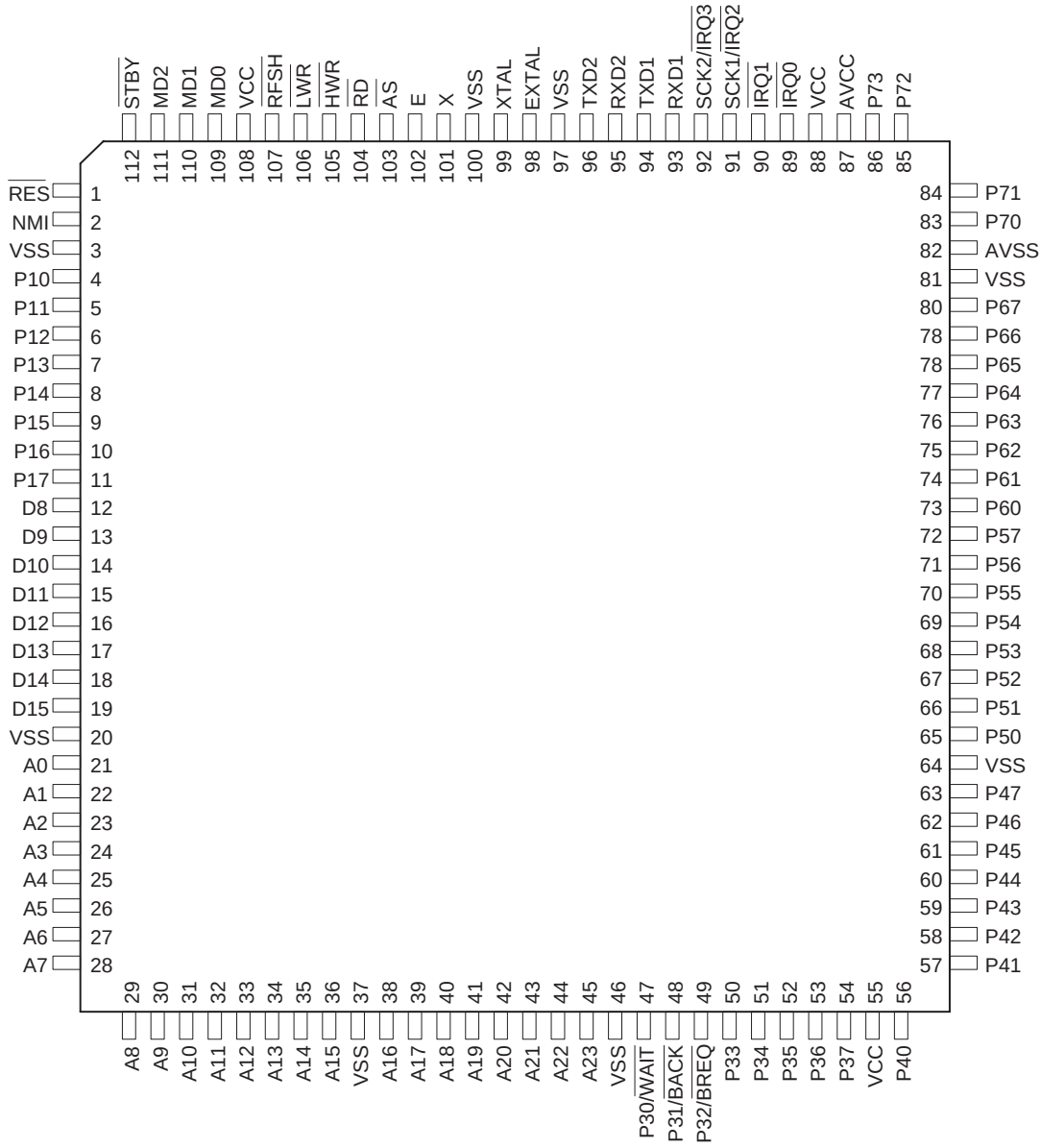
1. Hardware block diagram



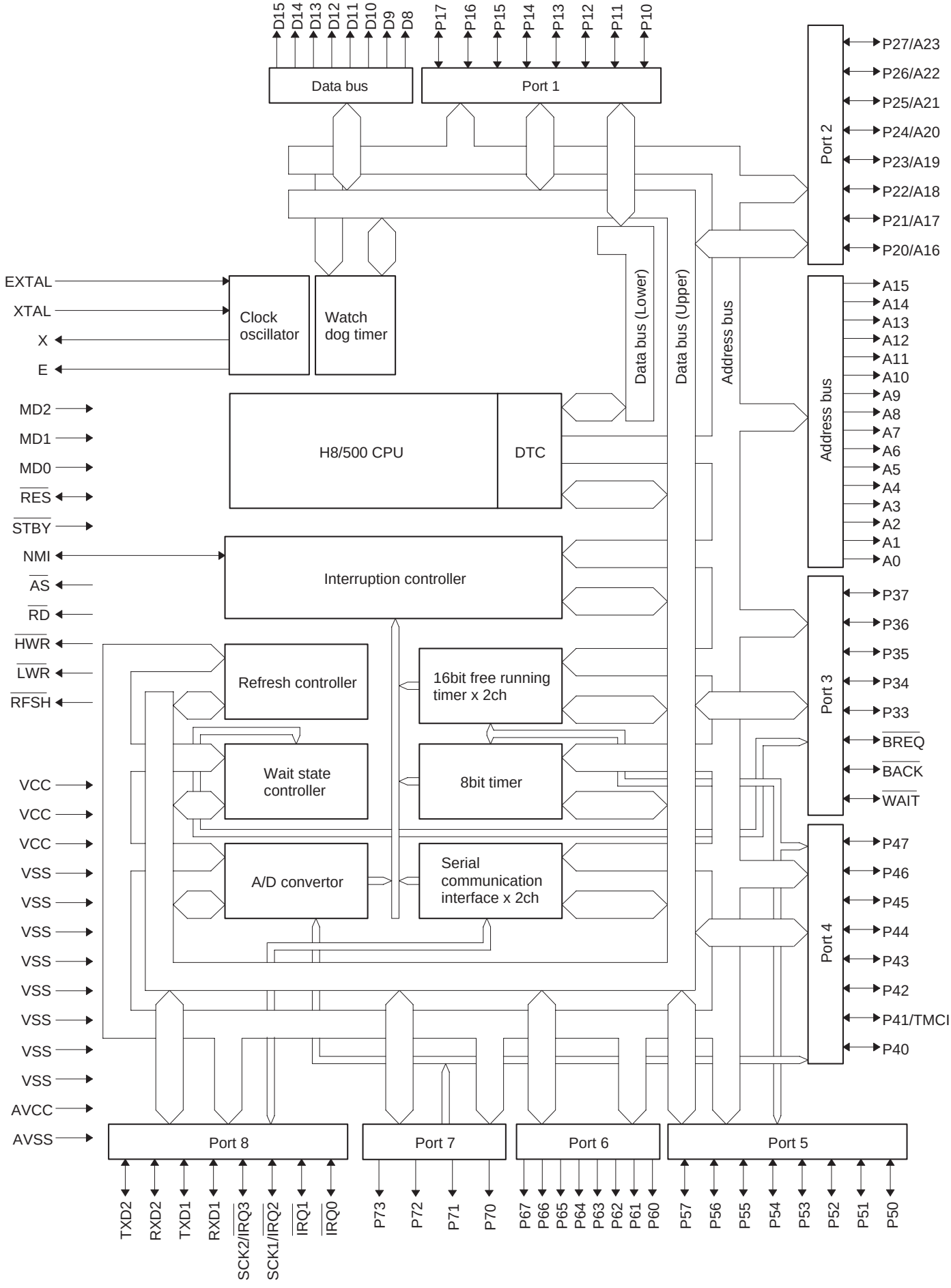
2. Description of main LSI's

2-1. CPU (HD6415108FX)

1) Pin description



2) Block diagram

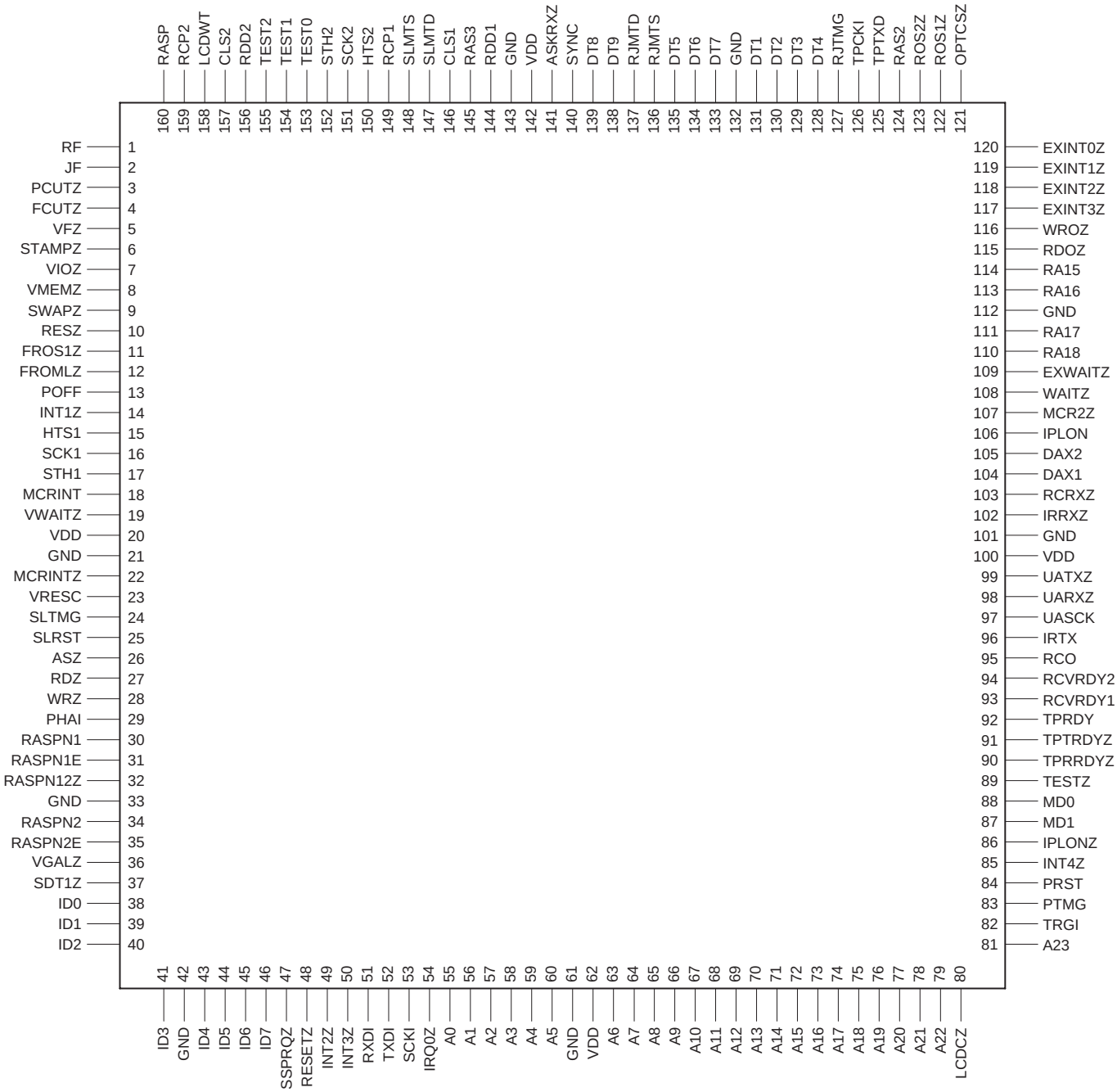


3) Pin description

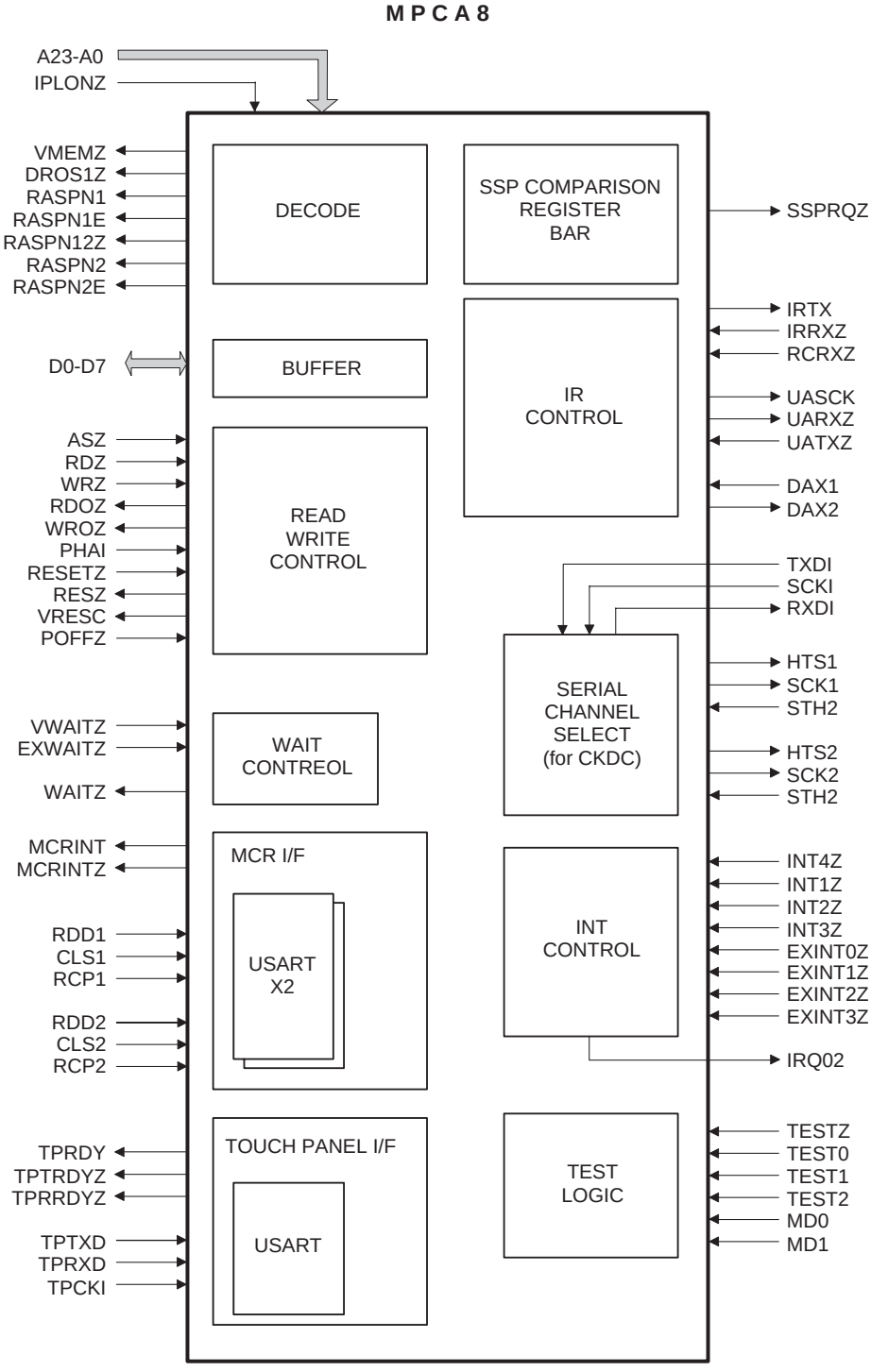
Pin No.	Symbol	Signal name	In/ Out	Function
1	/RES	/RESET	In	Reset signal
2	NMI	NMI	In	Non-maskable interrupt input for SSP interrupt input.
3	VSS	GND	In	GND
4	D0	D0	I/O	Data bus
5	D1	D1	I/O	Data bus
6	D2	D2	I/O	Data bus
7	D3	D3	I/O	Data bus
8	D4	D4	I/O	Data bus
9	D5	D5	I/O	Data bus
10	D6	D6	I/O	Data bus
11	D7	D7	I/O	Data bus
12	D8	D8	I/O	Data bus
13	D9	D9	I/O	Data bus
14	D10	D10	I/O	Data bus
15	D11	D11	I/O	Data bus
16	D12	D12	I/O	Data bus
17	D13	D13	I/O	Data bus
18	D14	D14	I/O	Data bus
19	D15	D15	I/O	Data bus
20	VSS	GND	In	GND
21	A0	A0	Out	Address bus
22	A1	A1	Out	Address bus
23	A2	A2	Out	Address bus
24	A3	A3	Out	Address bus
25	A4	A4	Out	Address bus
26	A5	A5	Out	Address bus
27	A6	A6	Out	Address bus
28	A7	A7	Out	Address bus
29	A8	A8	Out	Address bus
30	A9	A9	Out	Address bus
31	A10	A10	Out	Address bus
32	A11	A11	Out	Address bus
33	A12	A12	Out	Address bus
34	A13	A13	Out	Address bus
35	A14	A14	Out	Address bus
36	A15	A15	Out	Address bus
37	VSS	GND	In	GND
38	A16	A16	Out	Address bus
39	A17	A17	Out	Address bus
40	A18	A18	Out	Address bus
41	A19	A19	Out	Address bus
42	A20	A20	Out	Address bus
43	A21	A21	Out	Address bus
44	A22	A22	Out	Address bus
45	A23	A23	Out	Address bus
46	VSS	GND	In	GND
47	P30	/WAIT	In	Wait signal
48	P31	/BACK	Out	Bus control request acknowledge signal
49	P32	/BREQ	In	Bus control request signal
50	P33	DOPS	In	Drawer open signal
51	P34	/DR0	Out	Option drawer open signal
52	P35	/DR1	Out	Option drawer open signal
53	P36	NC	NC	NC
54	P37	NC	NC	NC
55	VCC	VCC	In	+5V
56	P40	VCC	In	+5V
57	P41	GND	In	GND
58	P42	GND	In	GND
59	P43	GND	In	GND
60	P44	MCRINT	In	MCR interrupt signal
61	P45	GND	In	GND
62	P46	/SHEN	In	CKDC interface shift enable signal
63	P47	GND	In	GND
64	VSS	GND	In	GND
65	P50	GND	In	GND
66	P51	GND	In	GND
67	P52	GND	In	GND
68	P53	GND	In	GND
69	P54	GND	In	GND
70	P55	GND	In	GND
71	P56	GND	In	GND
72	P57	/STOP	Out	System reset output signal
73	P60	/IPLON0	In	From IPL SW of ER-A7RS
74	P61	/IPLON1	In	From IPL SW of UP-3300
75	P62	GND	In	GND
76	P63	NORDY	In	Flash Memory ready ("H" active)
77	P64	FVPON	Out	Flash Memory write protect ("L" active)
78	P65	BANK	Out	For IPL ROM
79	P66	GND	In	GND
80	P67	GND	In	GND
81	VSS	GND	In	GND
82	AVSS	GND	In	GND
83	P70	GND	In	GND
84	P71	GND	In	GND
85	P72	GND	In	GND
86	P73	GND	In	GND
87	AVCC	VCC	In	+5V
88	VCC	VCC	In	+5V
89	/IRQ0	/IRQ0	In	Interrupt signal 0
90	/IRQ1	/IRQ1	In	Interrupt signal 1
91	/IRQ2	UASCK	In	Synchronizing shift clock signal for IR
92	/IRQ3	SCKI	Out	CKDC interface synchronizing shift clock
93	RXD1	/UARX	In	RXD signal for IR
94	TXD1	/UATX	Out	TXD signal for IR
95	RXD2	RXDI	In	CKDC interface shift input data
96	TXD2	TXDI	Out	CKDC interface shift output data
97	VSS	GND	In	GND
98	EXTAL	EXTAL	In	Crystal oscillator connection 19.6MHz
99	XTAL	XTAL	In	Crystal oscillator connection 19.6MHz
100	VSS	GND	In	GND
101	X	#	Out	System clock
102	E	NC	NC	NC
103	/AS	/AS	Out	Address strobe
104	RD	/RD	Out	Read signal
105	/HWR	/HWR	Out	Write signal (HIGH)
106	/LWR	/LWR	Out	Write signal (LOW)
107	/RFSH	/RFSH	Out	Refresh cycle signal
108	VCC	VCC	In	+5V
109	MD0	IPLON0	In	From IPL SW of ER-A7RS
110	MD1	IPLON0	In	From IPL SW of ER-A7RS
111	MD2	/IPLON0	In	From IPL SW of ER-A7RS
112	/STBY	VCC	In	+5V

2-2. G.A.(MPCA8)

1) Pin configuration



2) Block diagram



3) Pin description

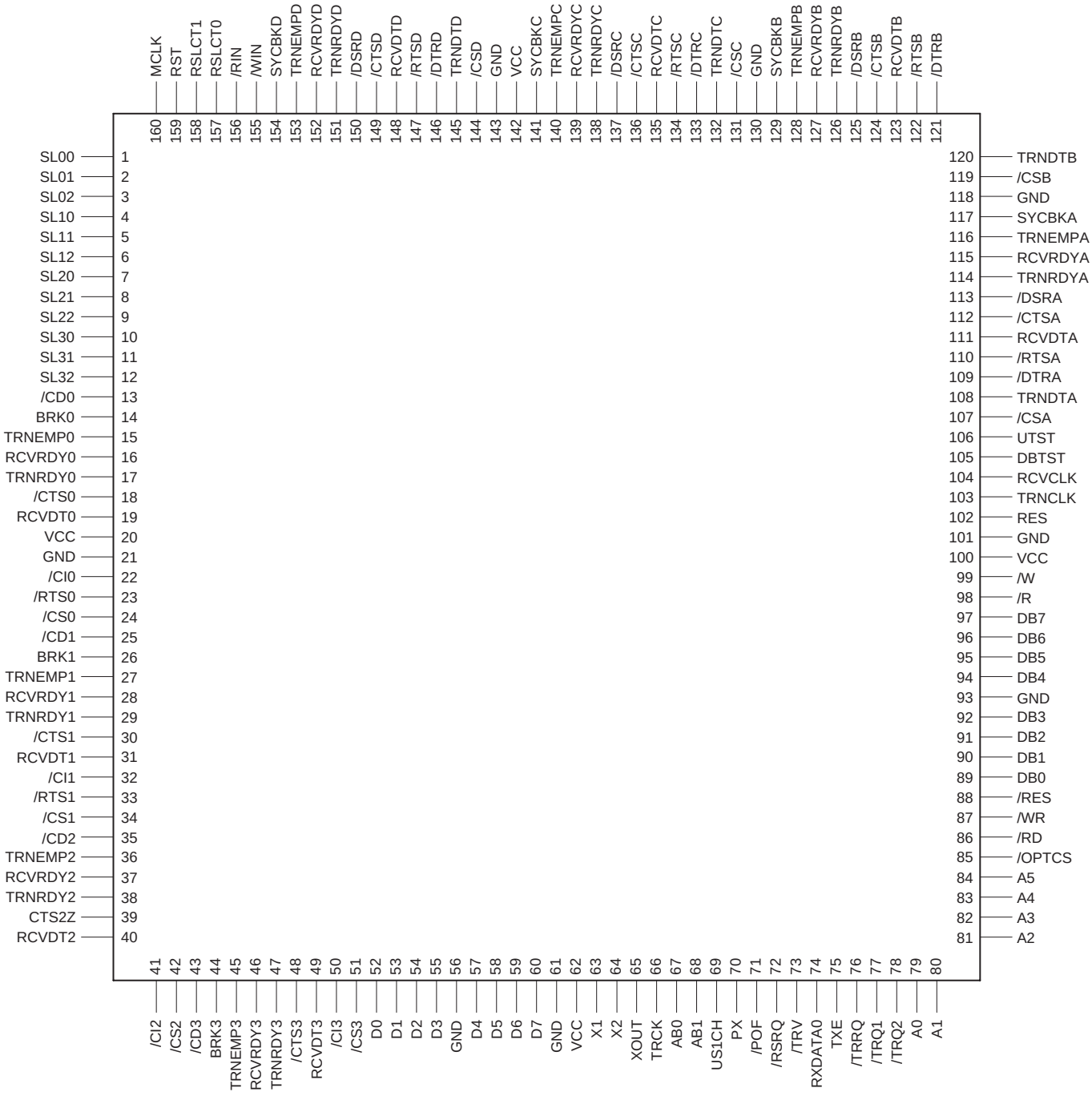
Pin No.	Name	I/O	Description
1	RF	ON	NU
2	JF	ON	NU
3	PCUTZ	ON	NU
4	FCUTZ	ON	NU
5	VFZ	ON	NU
6	STAMPZ	ON	NU
7	VIOZ	O	NU
8	VMEMZ	O	VRAM DEOCDE
9	SWAPZ	O	NU
10	RESZ	O6M	RESET
11	FROS1Z	O	FLASH ROM DECODE
12	FROMLZ	O	NU
13	POFF	IC	POWER OFF SIGNAL INPUT
14	INT1Z	ICU	INTERRUPT SIGNAL INPUT
15	HTS1	O	SERIAL OUT (CKDC INTERFACE)
16	SCK1	O	SERIAL CLOCK (CKDC INTERFACE)
17	STH1	IS	SERIAL IN (CKDC INTERFACE)
18	MCRINT	O	MCR INTRRUPT OUT
19	VWAITZ	IU	VGA WAIT INPUT
20	VDD	–	
21	GND	–	
22	MCRINTZ	O	MCR INTRRUPT OUT
23	VRESC	ON	TURNS ACTIVE WHEN RESET&POWER DOWN IS MET
24	SLTMG	ICS	GND
25	SLRST	ICS	GND
26	ASZ	I	ADDRESS STROBE
27	RDZ	I	READ STROBE
28	WRZ	I	WRITE STROBE
29	PHAI	IS	SYSTEM CLOCK (9.83MHz)
30	RASPN1	O	PSRAM DECODE1
31	RASPN1E	O	PSRAM DECODE1 (EVEN)
32	RASPN12Z	O	PSRAM DECODE1 OR 2
33	GND	–	
34	RASPAN2	O	PSRAM DECODE2
35	RASPN2E	O	PSRAM DECODE2(EVEN)
36	VGALZ	O	NU
37	SDT1Z	O	NU
38	ID0	IO	DATA BUS
39	ID1	IO	DATA BUS
40	ID2	IO	DATA BUS
41	ID3	IO	DATA BUS
42	GND	–	
43	ID4	IO	DATA BUS
44	ID5	IO	DATA BUS
45	ID6	IO	DATA BUS
46	ID7	IO	DATA BUS
47	SSPRQZ	O	SSP REQUEST FOR CPU
48	RESETZ	ICS	MPCA RESET
49	INT2Z	ICU	INTERRUPT INPUT (/TPRRDY)
50	INT3Z	ICU	INTERRUPT INPUT (/TPTRDY)
51	RXDI	O	SERIAL OUT FOR CPU
52	TXDI	IS	SERIAL IN FROM CPU
53	SCKI	IU	SERIAL CLOCK FROM CPU
54	IRQ0Z	O	INTERRUPT SIGNAL FOR CPU
55	A0	I	ADDRESS BUS
56	A1	I	ADDRESS BUS
57	A2	I	ADDRESS BUS
58	A3	I	ADDRESS BUS
59	A4	I	ADDRESS BUS
60	A5	I	ADDRESS BUS
61	GND	–	
62	VDD	–	
63	A6	I	ADDRESS BUS
64	A7	I	ADDRESS BUS
65	A8	I	ADDRESS BUS
66	A9	I	ADDRESS BUS
67	A10	I	ADDRESS BUS
68	A11	I	ADDRESS BUS
69	A12	I	ADDRESS BUS
70	A13	I	ADDRESS BUS
71	A14	I	ADDRESS BUS
72	A15	I	ADDRESS BUS
73	A16	I	ADDRESS BUS
74	A17	I	ADDRESS BUS
75	A18	I	ADDRESS BUS
76	A19	I	ADDRESS BUS
77	A20	I	ADDRESS BUS
78	A21	I	ADDRESS BUS
79	A22	I	ADDRESS BUS
80	LCDCZ	O	NU
81	A23	I	ADDRESS BUS
82	TRGI	IS	NU
83	PTMG	O	NU
84	PRST	O	NU
85	INT4Z	ICU	NU
86	IPLONZ	IU	IPL SIGNAL FROM OPTION CONNECTER
87	MD1	ICU	TEST PIN
88	MD0	ICU	TEST PIN
89	TESTZ	ICU	TEST PIN
90	TPRRDYZ	O	TOUCH PANEL INTERRUPT (CONNECTED TO INT2Z)
91	TPTRDYZ	O	TOUCH PANEL INTERRUPT (CONNECTED TO INT3Z)
92	TPRDY	O	NU
93	RCVRDY1	IU	NU
94	RCVRDY2	IU	NU
95	RCO	O	NU
96	IRTX	O	IR OUT
97	UASCK	O	IR CLOCK

Pin No.	Name	I/O	Description
98	UARXZ	O	IR DATA FOR CPU
99	UATXZ	IU	IR DATA FROM CPU
100	VDD	–	
101	GND	–	
102	IRRXZ	ICS	IR IN FROM IR UNIT
103	RCRXZ	ICS	NU
104	DAX1	OSCI	IR CLOCK (7.37MHz)
105	DAX2	OSCO	IR CLOCK (7.37MHz)
106	IPLON	O	IPLON SIGNAL
107	MCR2Z	O	NU
108	WAITZ	O	WAIT FOR CPU
109	EXWAITZ	IU	EXTERNAL WAIT INPUT SIGNAL
110	RA18	O	NU
111	RA17	O	NU
112	GND	–	
113	RA16	O	NU
114	RA15	O	NU
115	RDOZ	O8M	EXPANSION RD
116	WROZ	O8M	EXPANSION WR
117	EXINT3Z	ICS	EXPANSION INTERRUPT SIGNAL
118	EXINT2Z	ICS	EXPANSION INTERRUPT SIGNAL
119	EXINT1Z	ICS	EXPANSION INTERRUPT SIGNAL
120	EXINT0Z	ICS	EXPANSION INTERRUPT SIGNAL
121	OPTCSZ	O	BASE DECODE SIGNAL FOR EXPANSION SLOT
122	ROS1Z	O	NU
123	ROS2Z	O	N U
124	RAS2	O	NU
125	TPTXD	O	SERIAL OUT FOR TOUCH PANEL
126	TPRXD	ICS	SERIAL IN FROM TOUCH PANEL
127	TPCKI	ICS	SERIAL CLOCK 9.83MHz/64 (TOUCH PANEL INTERFACE)
128	DT4	ON	NU
129	DT3	ON	NU
130	DT2	ON	NU
131	DT1	ON	NU
132	GND	–	
133	DT7	ON	NU
134	DT6	ON	NU
135	DT5	ON	NU
136	RJMTS	ON	NU
137	RJMTD	ON	NU
138	DT9	ON	NU
139	DT8	ON	NU
140	SYNC	IU	NU
141	ASKRXZ	ICS	IR INPUT FROM IR UNIT
142	VDD	–	
143	GND	–	
144	RDD1	ICS	SERIAL IN FROM MCR TRACK1
145	RAS3	O	NU
146	CLS1	ICS	CARD SENSE ON MCR TRACK1
147	SLMTD	ON	NU
148	SLMTS	ON	NU
149	RCP1	ICS	CLOCK PULSE FROM MCR TRACK1
150	HTS2	O	SERIAL OUT (OPTION CKDC INTERFACE) NU
151	SCK2	O	SERIAL CLOCK (OPTION CKDC INTERFACE) NU
152	STH2	IS	SERIAL IN (OPTION CKDC INTERFACE) NU
153	TEST0	I	TEST PIN
154	TEST1	I	TEST PIN
155	TEST2	I	TEST PIN
156	RDD2	ICS	SERIAL IN FROM MCR TRACK1
157	CLS2	ICS	CARD SENSE ON MCR TRACK1
158	LCDWT	IU	NU
159	RCP2	ICS	CLOCK PULSE FROM MCR TRACK1
160	RASP	O	NU

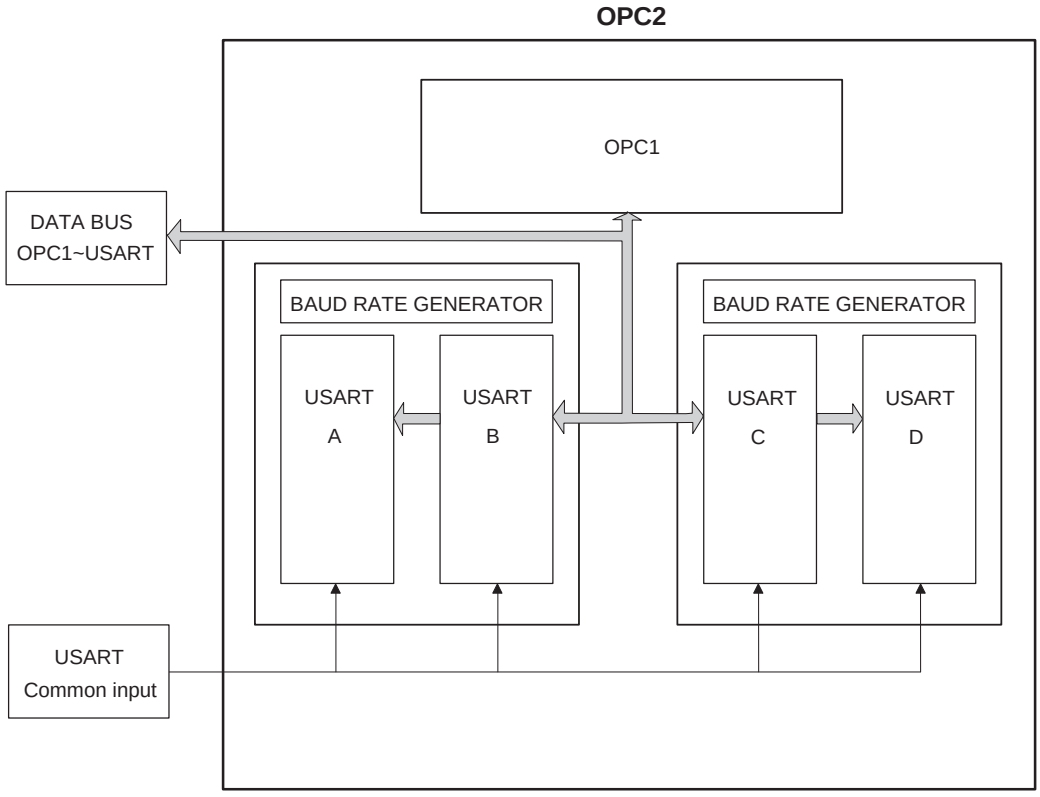
I	TTL input
IS	TTL Schmidt input
IU	TTL pull up input
IC	CMOS input
ICS	CMOS Schmidt input
ICU	CMOS pull up input
IO	TTL I/O
O	Output 4mA
O8M	Output 8mA
ON	Nch open drain output
OSIC	Oscillation circuit input
OSCI	Oscillation circuit output

2-3. OPC2

1) Pin configuration



2) Block diagram



3) Pin description

Pin NO.	Name	UP-3300	I/O	Description
1	SL00	VCC	ISU	RS-232/UNIT0 channel select
2	SL01	GND	ISU	
3	SL02	GND	ISU	
4	SL10	GND	ISU	RS-232/UNIT1 channel select
5	SL11	VCC	ISU	
6	SL12	GND	ISU	
7	SL20	VCC	ISU	RS-232/UNIT2 channel select
8	SL21	VCC	ISU	
9	SL22	VCC	ISU	
10	SL30	GND	ISU	RS-232/UNIT3 channel select
11	SL31	GND	ISU	
12	SL32	GND	ISU	
13	/CD0	/DCD1	IS	RS-232 control signal /CD input
14	BRK0	BRK1	IS	RS-232 break signal
15	TRNEMP0	TRENMP1	IS	RS-232 transmission buffer empty signal
16	RCVRDY0	RCVRDY1	IS	RS-232 data reception enable signal
17	TRNRDY0	TRNRDY1	IS	RS-232 transmission enable signal
18	/CTS0	/CTS1	IS	RS-232 clear to send signal
19	RCVDT0	RCVDT1	IS	RS-232 reception data signal
20	VCC	VCC		+5V
21	GND	GND		GND
22	/CI0	/CI1	IS	RS-232 control signal /CI input
23	/RTS0	/RTS1	O	RS-232 request to send signal

Pin NO.	Name	UP-3300	I/O	Description
24	/CS0	/CS1	O	RS-232 chip select signal
25	/CD1	/DCD2	IS	RS-232 control signal /CD input
26	BRK1	BRK2	IS	RS-232 break signal
27	TRNEMP1	TRENMP2	IS	RS-232 transmission buffer empty signal
28	RCVRDY1	RCVRDY2	IS	RS-232 data reception enable signal
29	TRNRDY1	TRNRDY2	IS	RS-232 transmission enable signal
30	/CTS1	/CTS2	IS	RS-232 clear to send signal
31	RCVDT1	RCVDT2	IS	RS-232 reception data signal
32	/CI1	/CI2	IS	RS-232 control signal /CI input
33	/RTS1	/RTS2	O	RS-232 request to send signal
34	/CS1	/CS2	O	RS-232 chip select signal
35	/CD2	VCC	IS	+5V
36	TRNEMP2	TRENMP3	IS	RS-232 transmission buffer empty signal
37	RCVRDY2	RCVRDY3	IS	RS-232 data reception enable signal
38	TRNRDY2	TRNRDY3	IS	RS-232 transmission enable signal
39	CTS2Z	/CTS3	IS	RS-232 clear to send signal

Pin NO.	Name	UP-3300	I/O	Description
40	RCVDT2	RCVDT3	IS	RS-232 reception to send signal
41	/CI2	VCC	IS	+5V
42	/CS2	/CS3	O	RS-232 chip select signal
43	/CD3	/SINT	IS	RS-232: /CD, IN-LINE : /P1
44	BRK3	GND	IS	GND
45	TRNEMP3	GND	IS	GND
46	RCVRDY3	GND	IS	GND
47	TRNRDY3	GND	IS	GND
48	/CTS3	GND	IS	GND
49	RCVDT3	GND	IS	GND
50	/CI3	GND	IS	GND
51	/CS3	/SRCS	O	RS-232/INLINE chip select signal
52	D0	D0	IO	Data bus (CPU)
53	D1	D1	IO	Data bus (CPU)
54	D2	D2	IO	Data bus (CPU)
55	D3	D3	IO	Data bus (CPU)
56	GND	GND		GND
57	D4	D4	IO	Data bus (CPU)
58	D5	D5	IO	Data bus (CPU)
59	D6	D6	IO	Data bus (CPU)
60	D7	D7	IO	Data bus (CPU)
61	GND	GND		GND
62	VCC	VCC		+5V
63	X1	NC	O OSI14	NC
64	X2	#	I OSI14	System clock
65	XOUT	CLK_USART	O	Clock (USART)
66	TRCK	NC	O	NC
67	AB0	AH0	O	Address bus for USART
68	AB1	AH1	O	Address bus for USART
69	US1CH	GND	IS	GND
70	PX	NC	O	NC
71	/POF	/POFF	IS	POFF signal
72	/RSRQ	/IRQ1	3S	RS232 INTRRUPT
73	/TRV	GND	IS	GND
74	RXDATA0	NC	O	NC
75	TXE	/SRESET	O	INLINE TRNS ENABLE
76	/TRRQ	/TRQ2	3S	INLINE INTRRUPT
77	/TRQ1	/TRQ1	ON6	TIMER INTRRUPT (RS232)
78	/TRQ2	NC	ON6	TIMER INTRRUPT (INLINE)
79	A0	A0	I	Address bus for CPU
80	A1	A1	I	Address bus for CPU
81	A2	A2	I	Address bus for CPU
82	A3	A3	I	Address bus for CPU
83	A4	A4	I	Address bus for CPU
84	A5	A5	I	Address bus for CPU
85	/OPTCS	/OPTCS	I	Option chip select (from MPCA)
86	/RD	/RDO	I	Read signal (from CPU)
87	/WR	/WRO	I	Write signal (from CPU)
88	/RES	/RES	IS	Reset signal (from CPU)
89	DB0	DB0	IO	DATA BUS (USART)
90	DB1	DB1	IO	DATA BUS (USART)
91	DB2	DB2	IO	DATA BUS (USART)
92	DB3	DB3	IO	DATA BUS (USART)
93	GND	GND		GND
94	DB4	DB4	IO	DATA BUS (USART)
95	DB5	DB5	IO	DATA BUS (USART)
96	DB6	DB6	IO	DATA BUS (USART)
97	DB7	DB7	IO	DATA BUS (USART)
98	/R	/RDH	O	Read signal (to USART)
99	/W	/WRH	O	Write signal (to USART)
100	VCC	VCC		+5V
101	GND	GND		GND
102	RES	RES USART	O	Reset signal (to USART)
103	TRNCLK	GND	I	GND
104	RCVCLK	GND	I	GND
105	DBTST	/SRCS	ID	RS-232/INLINE USART chip select
106	UTST	VCC	ID	+5V
107	/CSA	/CS1	IS	USART_A chip select
108	TRNDTA	TXD1	O	RS-232 transmission data signal
109	/DTRA	/DTR1	O	RS-232 data terminal ready signal
110	/RTSA	NC	O	NC
111	RCVDTA	RCVDT1	IS	RS-232 reception data signal
112	/CTSA	GND	IS	GND
113	/DSRA	/DSR1	IS	RS-232 data set ready signal
114	TRNRDYA	TRNRDY1	O	RS-232 data transmission enable signal
115	RCVRDYA	RCVRDY1	O	RS-232 data reception enable signal
116	TRNEMPA	TRNEMP1	O	RS-232 transmission buffer empty signal
117	SYCBKA	BRK1	IO	Break code detection signal
118	GND	GND		GND
119	/CSB	/CS2	IS	USART_B chip select
120	TRNDTB	TXD2	O	RS-232 transmission data signal
121	/DTRB	/DTR2	O	RS-232 data terminal ready signal
122	/RTSB	NC	O	NC
123	RCVDTB	RCVDT2	IS	RS-232 reception data signal
124	/CTSB	GND	IS	GND
125	/DSRB	/DSR2	IS	RS-232 data set ready signal
126	TRNRDYB	TRNRDY2	O	RS-232 data transmission enable signal
127	RCVRDYB	RCVRDY2	O	RS-232 data reception enable signal
128	TRNEMPB	TRNEMP2	O	RS-232 transmission buffer empty signal
129	SYCBKB	BRK2	IO	Break code detection signal
130	GND	GND		GND

Pin NO.	Name	UP-3300	I/O	Description
131	/CSC	/CS3	IS	USART_C chip select
132	TRNDTC	TXD3	O	RS-232 transmission data signal
133	/DTRC	/DTR3	O	RS-232 data terminal ready signal
134	/RTSC	/RTS3	O	USART_C request to send
135	RCVDTC	RCVDT3	IS	RS-232 reception data signal
136	/CTSC	GND	IS	GND
137	/DSRC	/DSR3	IS	RS-232 data set ready signal
138	TRNRDYC	TRNRDY3	O	RS-232 data transmission enable signal
139	RCVRDYC	RCVRDY3	O	RS-232 data reception enable signal
140	TRNEMPC	TRNEMP3	O	RS-232 transmission buffer empty signal
141	SYCBKC	NC	IO	NC
142	VCC	VCC		+5V
143	GND	GND		GND
144	/CSD	VCC	IS	USART_D chip select
145	TRNDTD	NC	O	NC
146	/DTRD	NC	O	NC
147	/RTSD	NC	O	NC
148	RCVDTD	GND	IS	GND
149	/CTSD	GND	IS	GND
150	/DSRD	GND	IS	GND
151	TRNRDYD	NC	O	NC
152	RCVRDYD	NC	O	NC
153	TRNEMPD	NC	O	NC
154	SYCBKD	NC	IO	NC
155	/WIN	/WRH	I	Write signal
156	/RIN	/RDH	I	Read signal
157	RSLCT0	AH0	I	Address bus
158	RSLCT1	AH1	I	Address bus
159	RST	RES USART	IS	Reset signal
160	MCLK	CLK USART	I	

I TTL input
ID TTL input with pull down
IS TTL Schmidt input
ISU TTL Schmidt input with pull up
IO TTL I/O
3S 3-state Buffer (6mA)
ON6 Open drain (6mA)

2-4. Z80 CPU

1) Features

The extensive instruction set contains 158 instructions, including the 8080A instruction set as a subset.

- NMOS version for low cost high performance solutions, CMOS version for high performance low power designs.
- Z0840006 - 6.17 MHz
- CMOS Z84C0006 - DC to 6.17 MHz, Z84C008 - DC to 8 MHz, Z84C0010 - DC to 10 MHz, Z84C0020 - DC - 20 MHz
- 6 MHz version can be operated at 6.144 MHz clock.
- The Z80 microprocessors and associated family of peripherals can be linked by a vectored interrupt system. This system can be daisy-chained to allow implementation of a priority interrupt scheme.
- Duplicate set of both general-purpose and flag registers.
- Two sixteen-bit index registers.
- Three modes of maskable interrupts:
  Mode 0 — 8080A similar;
  Mode 1 — Non-Z80 environment, location 38H;
  Mode 2 — Z80 family peripherals, vectored interrupts.
- On-chip dynamic memory refresh counter.

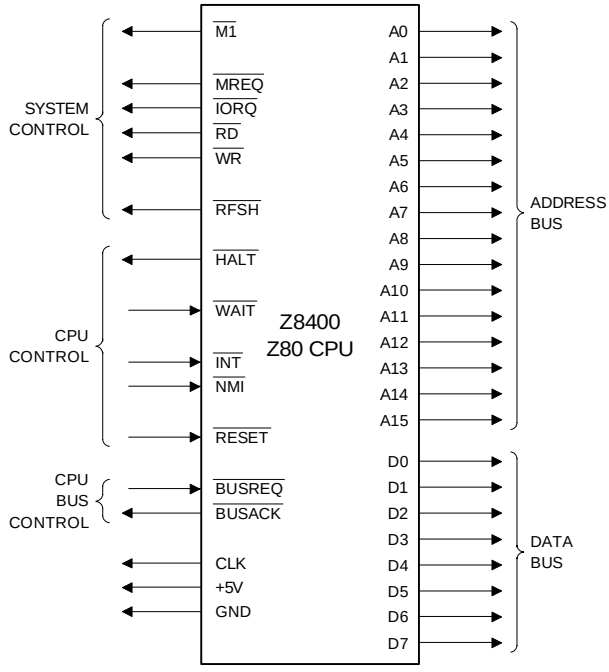
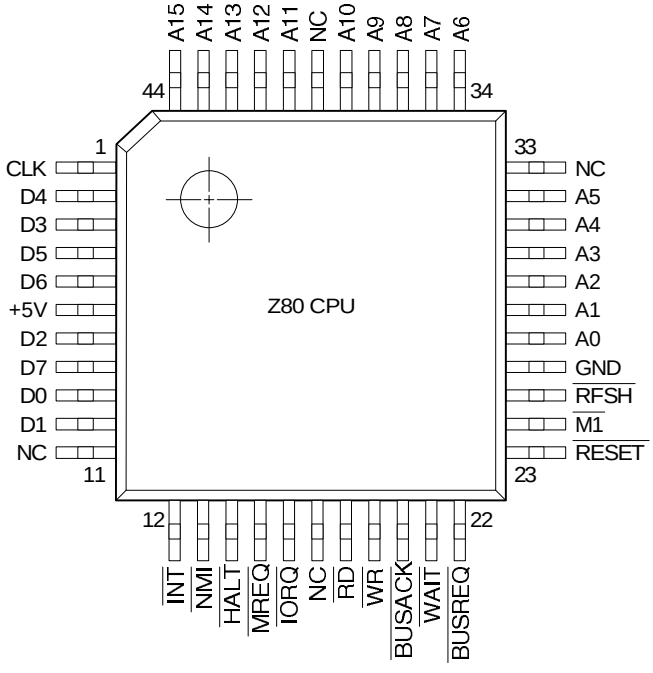


Figure 1. Pin functions

2) Pin configuration



44 pin Quad Flat Pack (QFP), Pin Assignments
(Only available for 84C00)

3) General description

The CPUs are fourth-generation enhanced microprocessors with exceptional computational power. They offer higher system throughput and more efficient memory utilization than comparable second- and third-generation microprocessors. The internal registers contain 208 bits of read/write memory that are accessible to the programmer.

These registers include two sets of six general-purpose registers which may be used individually as either 8-bit registers or as 16-bit register pairs. In addition, there are two sets of accumulator and flag registers. A group of "Exchange" instructions makes either set of main or alternate registers accessible to the programmer. The alternate set allows operation in foreground-background mode or it may be reserved for very fast interrupt response.

The CPU also contains a Stack Pointer, Program Counter, two index registers, a Refresh register (counter), and an Interrupt register. The CPU is easy to incorporate into a system since it requires only a single +5V power source. All output signals are fully decoded and timed to control standard memory or peripheral circuits; the CPU is supported by an extensive family of peripheral controllers.

The internal block diagram (Figure 3) shows the primary functions of the processors. Subsequent text provides more detail on the I/O controller family, registers, instruction set, interrupts and daisy chaining, and CPU timing.

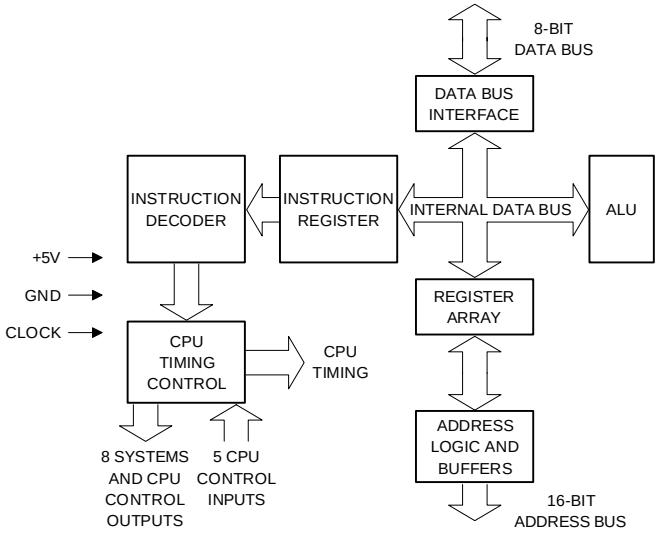


Figure 3. Z80C CPU Block Diagram

4) Pin description

Pin No.	Symbol	Signal name	In/Out	Function
1	CLK	CLK	In	Clock
2	D4	S D4	In/Out	Data bus
3	D3	S D3	In/Out	Data bus
4	D5	S D5	In/Out	Data bus
5	D6	S D6	In/Out	Data bus
6	+5V	VCC	—	+5V
7	D2	S D2	In/Out	Data bus
8	D7	S D7	In/Out	Data bus
9	D0	S D0	In/Out	Data bus
10	D1	S D1	In/Out	Data bus
11	NC	NC	—	NC
12	$\overline{INT}$	S INT	In	Interrupt request signal
13	$\overline{NMI}$	VCC	—	Non-maskable interrupt signal
14	$\overline{HALT}$	VCC	—	+5V
15	$\overline{MREQ}$	S $\overline{MRQ}$	Out	Memory request signal
16	$\overline{IORQ}$	S $\overline{IORQ}$	Out	Input / Output request signal
17	NC	NC	—	NC
18	$\overline{RD}$	S $\overline{RDS}$	Out	Rread signal
19	$\overline{WR}$	S $\overline{WRS}$	Out	Write signal
20	$\overline{BUSAK}$	$\overline{BUSAK}$	Out	Bus acknowledge signal
21	$\overline{WAIT}$	S $\overline{WAIT}$	In	Wait signal
22	$\overline{BUSRQ}$	$\overline{BUSRQ}$	In	Bus request signal
23	$\overline{RESET}$	S $\overline{RES}$	In	Reset signal
24	$\overline{M1}$	S M1	Out	Machine cycle one signal
25	$\overline{RFSH}$	NC	—	NC
26	GND	GND	—	GND
27	A0	S A0	Out	Address bus
28	A1	S A1	Out	Address bus
29	A2	S A2	Out	Address bus
30	A3	S A3	Out	Address bus
31	A4	S A4	Out	Address bus
32	A5	S A5	Out	Address bus
33	NC	NC	—	NC
34	A6	S A6	Out	Address bus
35	A7	S A7	Out	Address bus
36	A8	S A8	Out	Address bus
37	A9	S A9	Out	Address bus
38	A10	S A10	Out	Address bus
39	NC	NC	—	NC
40	A11	S A11	Out	Address bus
41	A12	S A12	Out	Address bus
42	A13	S A13	Out	Address bus
43	A14	S A14	Out	Address bus
44	A15	S A15	Out	Address bus

2-5. Z80 CTC

1) Features

- Four independently programmable counter/timer channels, each with a readable downcounter and a selectable 16 or 256 prescaler. Downcounters are reloaded automatically at zero count.
- Selectable positive or negative trigger initiates timer operation.
- Three channels have Zero Count/Timeout outputs capable of driving Darlington transistors. (1.5mV @ 1.5V)
- NMOS version for cost sensitive performance solutions.
- CMOS version for the designs requiring low power consumption
- NMOS Z0843004 - 4 MHz, Z0843006 - 6.17 MHz.
- CMOS Z84C3006 - DC to 6.17 MHz, Z84C3008 - DC to 8 MHz, Z84C3010 - DC to 10 MHz
- Interfaces directly to the Z80 CPU or—for baud rate generation—to the Z80 SIO.
- Standard Z80 Family daisy-chain interrupt structure provides fully vectored, prioritaized interrupts without external logic. The CTC may also be used as an interrupt controller.
- 6 MHz version supports 6.144 MHz CPU clock operation.

2) General description

The Z80 CTC, hereinafter referred to as Z80 CTC or CTC, four-channel counter/timer can be programmed by system software for a broad range of counting and timing applications. The four independently programmable channels of the Z80 CTC satisfy common microcomputer system requirements for event counting, interrupt and interval timing, and general clock rate generation.

System design is simplified because the CTC connects directly to both the Z80 CPU and the Z80 SIO with no additional logic. In larger systems, address decoders and buffers may be required.

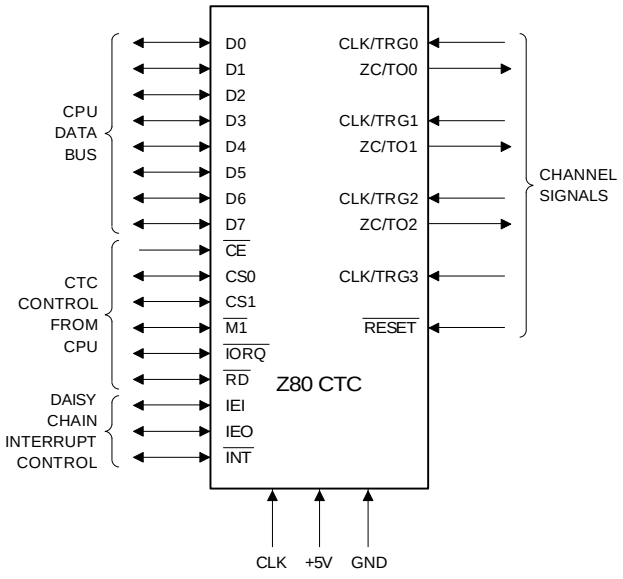


Figure 1. Pin Functions

Programming the CTC is straightforward: each channel is programmed with two bytes: a third is necessary when interrupts are enabled. Once started, the CTC counts down, automatically reloads its time constant, and resumes counting. Software timing loops are completely eliminated. Interrupt processing is simplified because only one vector need be specified: the CTC internally generates a unique vector for each channel.

The Z80 CTC requires a single +5% V power supply and the standard Z80 single-phase system clock. It is packaged in 28-pin DIPs, a 44-pin plastic chip carrier, and a 44-pin Quad Flat Pack. (Figures 2a, 2b, and 2c). Note that the QFP package is only available for CMOS versions.

3) Pin configuration

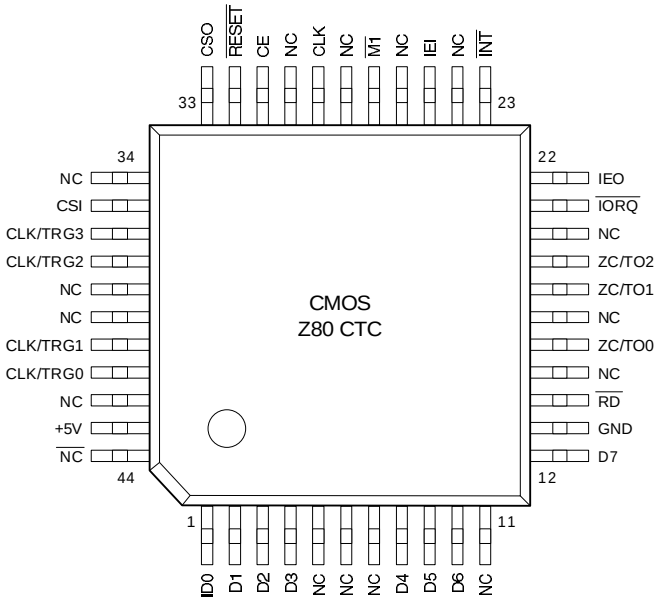


Figure 2c. 44-pin Quad Flat Pack Pin Assignments

4) Functional description

The Z80 CTC has four independent counter/timer channels. Each channel is individually programmed with two words: a control word and a time-constant word. The control word selects the operating mode (counter or timer), enables or disables the channel interrupt, and selects certain other operating parameters. If the timing mode is selected, the control word also sets a prescaler, which divides the system clock by either 16 or 256. The time-constant word is a value from 1 to 256.

During operation, the individual counter channel counts down from the preset time constant value. In counter mode operation the counter decrements on each of the CLK/TRG input pulses until zero count is reached. Each decrement is synchronized by the system clock. For counts greater than 256, more than one counter can be cascaded. At zero count, the down-counter is automatically reset with the time constant value.

The timer mode determines time intervals as small as 2 µs (8 MHz), 3 µs (6 MHz), or 4 µs (4 MHz) without additional logic or software timing loops. Time intervals are generated by dividing the system clock with a prescaler that decrements a preset down-counter.

Thus, the time interval is an integral multiple of the clock period, the prescaler value (16 or 256), and the time constant that is preset in the down-counter. A timer is triggered automatically when its time constant value is programmed, or by an external CLK/TRG input.

Three channels have two outputs that occur at zero count.

The first output is a zero-count/timeout pulse at the ZC/TO output. The fourth channel (Channel 3) does not have a ZC/TO output; interrupt request is the only output available from Channel 3.

The second output is Interrupt Request ($\overline{INT}$), which occurs if the channel has its interrupt enabled during programming. When the Z80 CPU acknowledges Interrupt Request, the Z80 CTC places an interrupt vector on the data bus.

The four channels of the Z80 CTC are fully prioritized and fit into four configuous slots in a standard Z80 daisy-chain interrupt structure. Channel 0 is the highest priority and Channel 3 the lowest. Interrupts can be individually enabled (or disabled) for each of the four channels.

5) Pin description

Pin No.	Symbol	Signal name	In/Out	Function
1	D0	S D0	In/Out	Data bus
2	D1	S D1	In/Out	Data bus
3	D2	S D2	In/Out	Data bus
4	D3	S D3	In/Out	Data bus
5	NC	NC	—	NC
6	NC	NC	—	NC
7	NC	NC	—	NC
8	D4	S D4	In/Out	Data bus
9	D5	S D5	In/Out	Data bus
10	D6	S D6	In/Out	Data bus
11	NC	NC	—	NC
12	D7	S D7	In/Out	Data bus
13	GND	GND	—	GND
14	$\overline{RD}$	S $\overline{RDS}$	In	Read cycle status signal
15	NC	NC	—	NC
16	ZC/TO0	S TM0	Out	Zero count / Timeout signal
17	NC	NC	—	NC
18	ZC/TO1	NC	—	NC
19	ZC/TO2	NC	—	NC
20	NC	NC	—	NC
21	$\overline{IORQ}$	S IORQ	In	Input / Output request signal
22	IEO	NC	—	NC
23	$\overline{INT}$	S INT	Out	Interrupt request signal
24	NC	NC	—	NC
25	IEI	VCC	—	+5V
26	NC	NC	—	NC
27	$\overline{M1}$	S M1	In	Machine cycle one signal
28	NC	NC	—	NC
29	CLK	CLK	In	System clock
30	NC	NC	—	NC
31	$\overline{CE}$	S A6	In	Chip enable signal
32	$\overline{RESET}$	S $\overline{RES}$	In	Reset signal
33	CS0	S A0	In	Channelselect signal

Pin No.	Symbol	Signal name	In/Out	Function
34	NC	NC	—	NC
35	CS1	S A1	In	Channelselect signal
36	CLK/TRG3	S TM1	In	External clock / timer signal
37	CLK/TRG2	S TM0	In	External clock / timer signal
38	NC	NC	—	NC
39	NC	NC	—	NC
40	CLK/TRG1	S $\overline{\text{INTS}}$	In	External clock / timer signal
41	CLK/TRG0	VCC	In	+5V
42	NC	NC	—	NC
43	+5V	VCC	—	+5V
44	NC	NC	—	NC

2-6. μPD71037

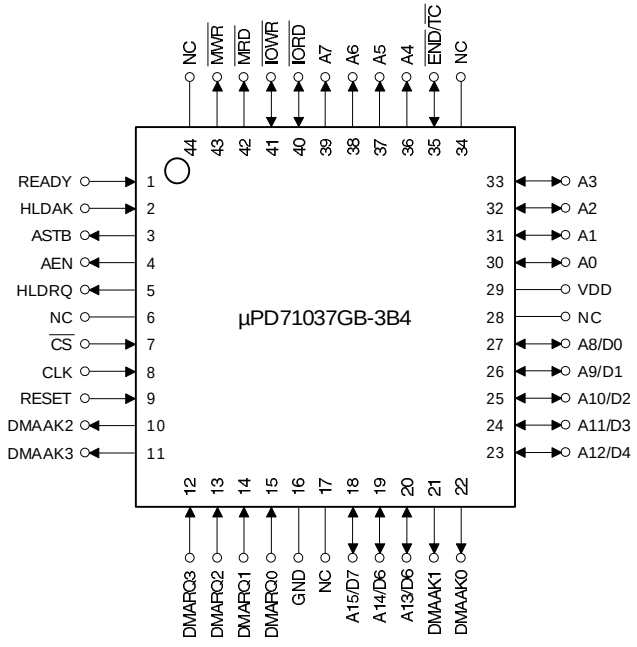
DMA CONTROLLER

The μPD71037 is a direct memory access controller (DMAC) for the micro processor system. It provides higher processing speed and lower power consumption in comparison with those in conventional use. Each of the four built-in DMA channels has 64-KB addresses and the function of counting the number of bytes of transferred data, and can transfer data from I/O to memory and from memory to memory as well.

1) FEATURES

- The clock speed is 10 MHz, twice that of the μPD8237A-5 (clock speed of 5 MHz).
- Each of the four DMA channels can be operated independently.
- Each channel can be self-initialized.
- Data is transferrable from memory to memory.
- Data in memory can independently initialized by block.
- High speed data transfer:
  3.2 MB/sec. (clock seed of 10 MHz, normal transfer mode)
  5.0 MB/sec. (clock speed of 10 MHz, compression transfer mode)
- The number of DMA channels can directly be expanded (Expansion mode).
- $\overline{\text{END}}$ input when data transfer is finished.
- Software DMA request available.
- CMOS
- Low power consumption

2) Pin configuration



3) Pin configuration

Pin No.	Symbol	Signal name	In/Out	Function
1	READY	READY	In	Ready signal
2	HLDAK	HLDAK	In	Hold acknowledge signal
3	ASTB	S ASTB	Out	Address strobe signal
4	AEN	S AEN	Out	Address enable signal
5	HLDRQ	HLDRQ	Out	Hold request signal
6	NC	NC	—	NC
7	$\overline{\text{CS}}$	$\overline{\text{CS}}$	In	Chip select signal
8	CLK	CLK	In	Clock
9	RESET	SRNRESET	In	Reset signal
10	DMAAK2	S DACK2	Out	DMA acknowlidge signal
11	DMAAK3	S DACK3	Out	DMA acknowlidge signal
12	DMARQ3	S DRQ3	In	DMA request signal
13	DMARQ2	S DRQ2	In	DMA request signal
14	DMARQ1	S DRQ1	In	DMA request signal
15	DMARQ0	S DRQ0	In	DMA request signal
16	GND	GND	—	GND
17	NC	NC	—	NC
18	A15/D7	S D7	In/Out	Data bus
19	A14/D6	S D6	In/Out	Data bus
20	A13/D5	S D5	In/Out	Data bus
21	DMAAK1	S DACK1	Out	DMA acknowlidge signal
22	DMAAK0	S DACK0	Out	DMA acknowlidge signal
23	A12/D4	S D4	In/Out	Data bus
24	A11/D3	S D3	In/Out	Data bus
25	A10/D2	S D2	In/Out	Data bus
26	A9/D1	S D1	In/Out	Data bus
27	A8/D0	S D0	In/Out	Data bus
28	NC	NC	—	NC
29	VDD	VCC	—	+5V
30	A0	S A0	In	Address bus
31	A1	S A1	In	Address bus
32	A2	S A2	In	Address bus
33	A3	S A3	In	Address bus
34	NC	NC	—	NC
35	$\overline{\text{END}}$ / $\overline{\text{TC}}$	TC	In/Out	End / Terminal cut signal
36	A4	S A4	In	Address bus
37	A5	S A5	In	Address bus
38	A6	S A6	In	Address bus
39	A7	S A7	In	Address bus
40	$\overline{\text{IORD}}$	S $\overline{\text{IOR}}$	In/Out	I/O read signal
41	$\overline{\text{IOWR}}$	S $\overline{\text{IOW}}$	In/Out	I/O write signal
42	$\overline{\text{MRD}}$	S $\overline{\text{MRD}}$	Out	Memory read signal
43	$\overline{\text{MWR}}$	NC	—	NC
44	NC	NC	—	NC

2-7. MB62H149

1) Outline

The MB62H149 is a semi-custom LSI chip for the peripheral circuits in the SRN (SHARP Retail Network), its main function is to communicate data with the host CPU and control the peripheral circuits and transmission control circuits of the Sub CPU (Z-80). Fig. 2. shows the general configuration of the functions:

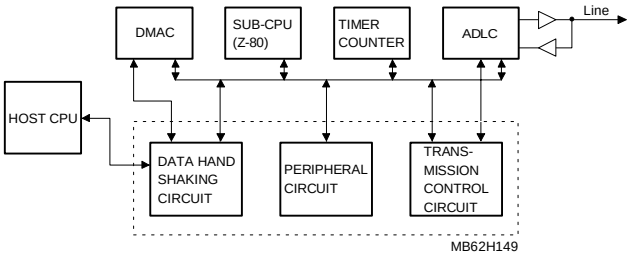


Fig. 2

2) Internal functions

(1) Data handshaking circuit

Is used because data processing speeds vary and the timing of the HOST CPU and SUB CPU do not synchronize, the MB62H149 is used for data handshaking. When the data handshaking portion is broken down, the system consists of a Write Signal from the HOST CPU to the MB62H149, Read Signal from the MB62H149 of the SUB CPU, Write Signal from the SUB CPU to the MB62H149 and Read Signal from the MB62H149 of the HOST CPU, all of which from two blocks as shown.

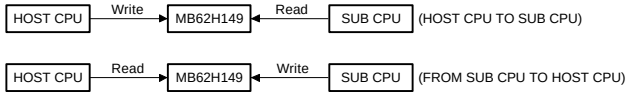


Fig. 3

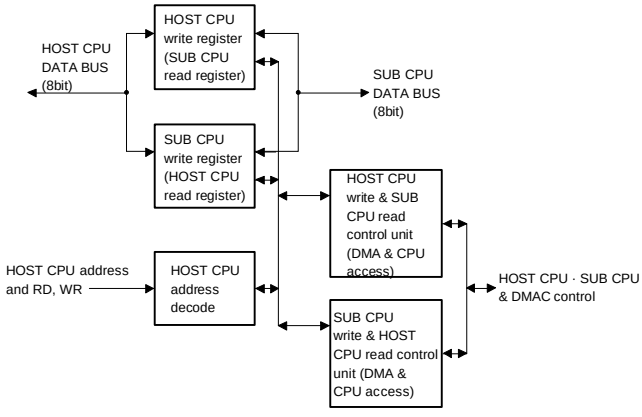

HOST CPU DATA BUS (8bit)
HOST CPU write register (SUB CPU read register)
SUB CPU DATA BUS (8bit)
SUB CPU write register (HOST CPU read register)
HOST CPU write & SUB CPU read control unit (DMA & CPU access)
HOST CPU address and RD, WR
HOST CPU address decode
HOST CPU · SUB CPU & DMAC control
SUB CPU write & HOST CPU read control unit (DMA & CPU access)

Fig. 4

(2) Peripheral circuit

The peripheral circuit consists of an I/O address generation unit on the SUB CPU, block dividing circuit, and the wait signal control unit.

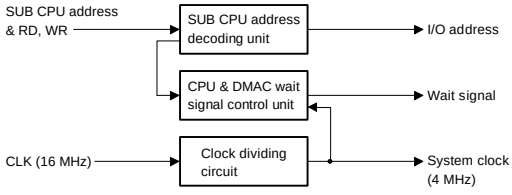

SUB CPU address & RD, WR
SUB CPU address decoding unit
I/O address
CPU & DMAC wait signal control unit
Wait signal
CLK (16 MHz)
Clock dividing circuit
System clock (4 MHz)

Fig. 5

(a) I/O address generation circuit

A total of 11 I/O addresses are generated by A0, A1, A4, A5 and RD and WR signals.

(b) CPU and DMAC wait signal control unit

Clocks into the CPU (Z-80), SUB CPU and its peripheral LSI, DMAC and CTC are operated respectively on 4 MHz.
While, the ADLC (MC68B54) (Advanced Data Link Control) is operated by the E (Enable clock) of 2 MHz according to restrictions in terms of the hardware of the LSI.
It is necessary to synchronize the timing of the write and read in the ADLC.
To control synchronization, timing, and input, the wait signal goes into the CPU for CPU access and into the DMAC for DMA access. This block is a circuit to generate such wait signal.

(c) Clock dividing circuit

This block divides the blocks according to the CLK supplied from outside to generate the clock for CPU, DMAC and CTC and the E and transmission clock rate (480 KBPS or 1 MBPS selectable) for the ADLC.

(3) Transmission control circuit

The transmission control circuit is divided into the modem unit, carrier detect unit, collision detect unit.

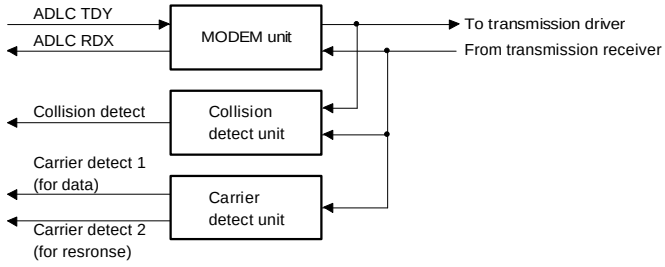


Fig. 6

(a) Modem circuit

The transmission data input from the ADLC are PE modulated (phase encoding modulation), the circuit to be output to the transmission driver and the reception data input from the transmission receiver are demodulated and produced at the ADLC.

(b) Collision detect circuit

The data transmitted from the home station is received and detects a collision on the transmission line by means of an exclusive OR gate.

(c) Carrier detect circuit

This circuit detects whether data is flowing on the transmission line. It consists of a circuit which immediately senses a no data status on the line. When data is not on the line the circuit functions to sense an elapse of the fixed time rate. The immediate sensing circuit is used for response testing and the delayed sensing circuit is used for data testing.
The fixed time rate is selectable according to the transmission speed as shown below via SRV-mode programming. Job #922.

Transmission speed	Delay time
1 MBPS	1.6m sec, 3.2m sec, 4.8m sec, 6.4m sec.
480 KBPS	3.2m sec, 6.4m sec, 9.6m sec, 12.8m sec.

3) Terminal Name and Description (MB62H149)

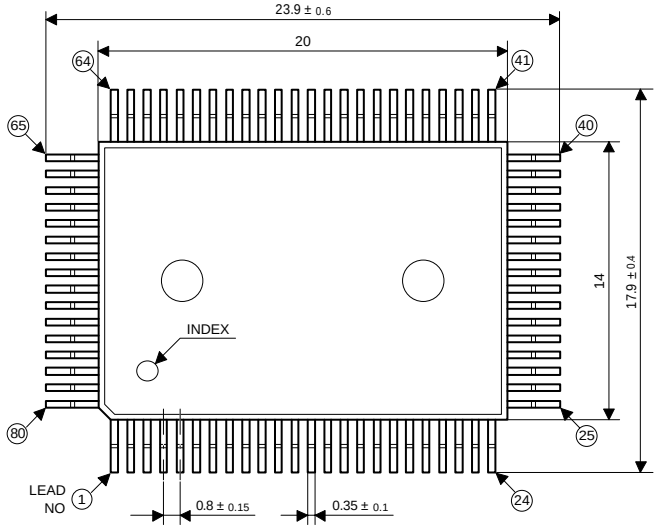
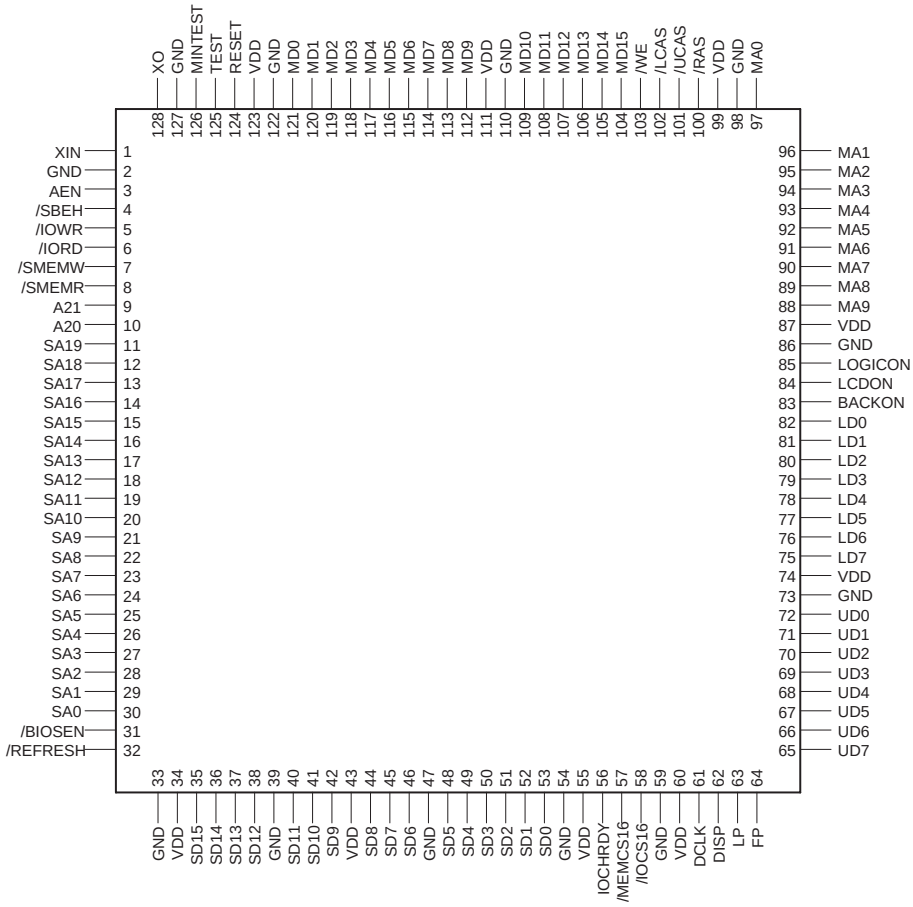


Fig. 7

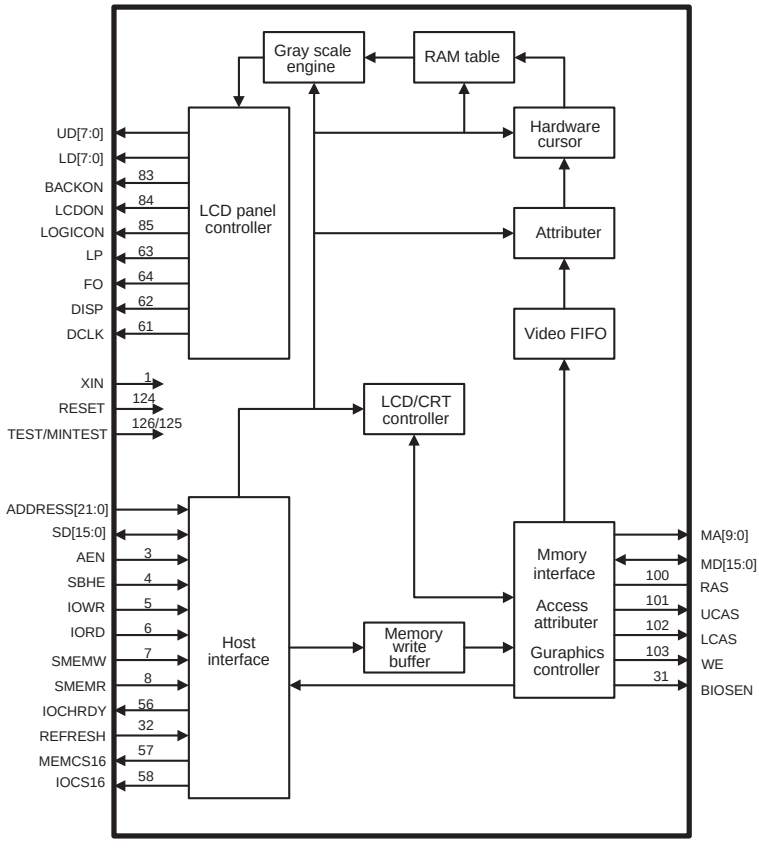
Pin No.	Terminal name	Host/ Sub	In/ Out	Description
1	CLK	Sub	In	Clock in (16 MHz)
2	—	—	—	N.U.
3	$\overline{\text{IORQ}}$	Sub	In	I/O request
4	$\overline{\text{MREQ}}$	Sub	In	Memory request
5	$\overline{\text{RDS}}$	Sub	In	Read from sub
6	$\overline{\text{WRS}}$	Sub	In	Write from sub
7	$\overline{\text{INTS}}$	Sub	Out	Interrupt to sub
8	ϕ	Sub	Out	Clock out
9	TM0	Sub	In	Timer 0
10	TM1	Sub	Out	Timer 1
11	$\overline{\text{MRD}}$	Sub	Out	Memory read
12	VSS	—	—	GND
13	$\overline{\text{WAIT}}$	Sub	Out	Wait signal
14	A15	Sub	Out	Address bus for DMA
16	A9	Sub	Out	
17	A8	Sub	Out	
18	A5	Sub	In	
19	A4	Sub	In	
20	A1	Sub	In	
21	A0	Sub	In	
22	DAK01	Sub	In	DMA acknowledge 0+1
23	—	—	—	N.U.
24	$\overline{\text{MWR0}}$	Sub	Out	Memory write
25	D7	Sub	I/O	Data bus
26	D6	Sub	I/O	
27	D5	Sub	I/O	
28	D4	Sub	I/O	
29	D3	Sub	I/O	
30	D2	Sub	I/O	
31	D1	Sub	I/O	
32	D0	Sub	I/O	
33	VDD	—	—	+5V
34	—	—	—	N.U.
35	$\overline{\text{RES}}$	Host	In	Reset
36	$\overline{\text{IO/WR}}$	Sub	I/O	I/O write
37	$\overline{\text{IO/RD}}$	Sub	I/O	I/O read
38	AEN	Sub	In	Address enable from DMAC
39	AST	Sub	In	Address strobe from DMAC
40	TCS	Sub	In	Terminal count
41	DAK23	Sub	In	DMA acknowledge 2+3
42	$\overline{\text{DRQRS}}$	Sub	Out	DMA request read to sub
43	$\overline{\text{DRQWS}}$	Sub	Out	DMA request write to sub
44	$\overline{\text{RDH}}$	Host	In	Read from Host
45	$\overline{\text{WRH}}$	Host	In	write from Host
46	$\overline{\text{INTH}}$	Host	Out	Interrupt to host
47	$\overline{\text{DAK}}$	Host	In	DMA acknowledge from host
48	TCH	Host	In	Terminal count from host
49	$\overline{\text{DRQWH}}$	Host	Out	DMA request read to host
50	$\overline{\text{DRQWH}}$	Host	Out	DMA request write to host
51	$\overline{\text{CS}}$	Host	In	Chip select from host
52	VSS	—	—	GND
53	—	—	—	N.U.
54	DB0	Host	I/O	Data bus
55	DB1	Host	I/O	Data bus
56	DB2	Host	I/O	Data bus
57	DB3	Host	I/O	Data bus
58	DB4	Host	I/O	Data bus
59	DB5	Host	I/O	Data bus
60	DB6	Host	I/O	Data bus
61	DB7	Host	I/O	Data bus
62	AB0	Host	In	Address bus from host
63	—	—	—	N.U.
64	AB1	Host	In	Address bus from host
65	COL	Sub	In	Collision detect signal
66	RDI	Sub	In	Receive data from receiver
67	TDI	Sub	Out	Transmmit data to driver
68	$\overline{\text{RTS}}$	Sub	In	Request to send
69	RXC	Sub	Out	Receive clock to ADLC
70	RXD	Sub	Out	Receive data to ADLC
71	TXC	Sub	Out	Transmmit clock
72	TXD	Sub	In	Transmmit data
73	VDD	—	—	+5V
74	E	Sub	In	Enable clock to ADLC
75	$\overline{\text{IRQ}}$	Sub	In	Interrupt request from ADLC
76	$\overline{\text{LCS}}$	Sub	Out	Link controller chip select
77	—	—	—	N.U.
78	RS1	Sub	Out	Register select 1
79	RS0	Sub	Out	Register select 0
80	MSK	Sub	Out	Mask signal

2-8. VGA controller (MN89303A)

1) Pin Configuration



2) Block diagram



3) Pin configuration

Pin No.	Symbol	Signal name	In/ Out	Function
1	XIN	XIN	In	25.175MHz
2	GND	GND	In	GND
3	AEN	GND	In	GND
4	/SBEH	/SBEH	In	System byte high enable
5	/IOWR	/IOWR	In	I/O write
6	/IORD	/IORD	In	I/O read
7	/SMEMW	/SMEMW	In	Meory write
8	/SMEMR	/SMEMR	In	Memory read
9	A21	GND	In	GND
10	A20	GND	In	GND
11	SA19	VCC	In	+5V
12	SA18	GND	In	GND
13	SA17	VCC	In	+5V
14	SA16	A16	In	Address bus
15	SA15	A15	In	Address bus
16	SA14	A14	In	Address bus
17	SA13	A13	In	Address bus
18	SA12	A12	In	Address bus
19	SA11	A11	In	Address bus
20	SA10	A10	In	Address bus
21	SA9	A9	In	Address bus
22	SA8	A8	In	Address bus
23	SA7	A7	In	Address bus
24	SA6	A6	In	Address bus
25	SA5	A5	In	Address bus
26	SA4	A4	In	Address bus
27	SA3	A3	In	Address bus
28	SA2	A2	In	Address bus
29	SA1	A1	In	Address bus
30	SA0	A0	In	Address bus
31	/BIOSEN	NC	In	NC
32	/REFRESH	/RFSH	In	Refresh signal
33	GND	GND	In	GND
34	VDD	VCC	In	+5V
35	SD15	D7	I/O	Data bus
36	SD14	D6	I/O	Data bus
37	SD13	D5	I/O	Data bus
38	SD12	D4	I/O	Data bus
39	GND	GND	In	GND
40	SD11	D3	I/O	Data bus
41	SD10	D2	I/O	Data bus
42	SD9	D1	I/O	Data bus
43	VDD	VCC	In	+5V
44	SD8	D0	I/O	Data bus
45	SD7	D15	I/O	Data bus
46	SD6	D14	I/O	Data bus
47	GND	GND	In	GND
48	SD5	D13	I/O	Data bus
49	SD4	D12	I/O	Data bus
50	SD3	D11	I/O	Data bus
51	SD2	D10	I/O	Data bus
52	SD1	D9	I/O	Data bus
53	SD0	D8	I/O	Data bus
54	GND	GND	In	GND
55	VDD	VCC	In	+5V
56	IOCHRDY	/VWAITI	Out	Channel ready signal
57	/MEMCS16	NC	In	NC
58	/IOCS16	NC	In	NC
59	GND	GND	In	GND

Pin No.	Symbol	Signal name	In/ Out	Function
60	VDD	VCC	In	+5V
61	DCLK	XCK	Out	Data shift clock
62	DISP	DISP	Out	Display enable
63	LP	LP	Out	Line pulse
64	FP	YD	OUt	Frame pulse
65	UD7	DU7	Out	Upper data
66	UD6	DU6	Out	Upper data
67	UD5	DU5	Out	Upper data
68	UD4	DU4	Out	Upper data
69	UD3	DU3	Out	Upper data
70	UD2	DU2	Out	Upper data
71	UD1	DU1	Out	Upper data
72	UD0	DU0	Out	Upper data
73	GND	GND	In	GND
74	VDD	VCC	In	+5V
75	LD7	DL7	Out	Lower data
76	LD6	DL6	Out	Lower data
77	LD5	DL5	Out	Lower data
78	LD4	DL4	Out	Lower data
79	LD3	DL3	Out	Lower data
80	LD2	DL2	Out	Lower data
81	LD1	DL1	Out	Lower data
82	LD0	DL0	Out	Lower data
83	BACKON	BKLT	Out	Back light On
84	LCDON	LCDON	Out	LCD drive power on signal
85	LOGICON	NC	Out	LCD logic power on signal
86	GND	GND	In	GND
87	VDD	VCC	In	+5V
88	MA9	NC	Out	NC
89	MA8	MA8	Out	Memory address bus
90	MA7	MA7	Out	Memory address bus
91	MA6	MA6	Out	Memory address bus
92	MA5	MA5	Out	Memory address bus
93	MA4	MA4	Out	Memory address bus
92	MA3	MA3	Out	Memory address bus
91	MA2	MA2	Out	Memory address bus
92	MA5	MA5	Out	Memory address bus
93	MA4	MA4	Out	Memory address bus
94	MA3	MA3	Out	Memory address bus
95	MA2	MA2	Out	Memory address bus
96	MA1	MA1	Out	Memory address bus
97	MA0	MA0	Out	Memory address bus
98	GND	GND	In	GND
99	VDD	VCC	In	VCC
100	/RAS	/RASV	Out	RAS address strobe
101	/UCAS	/UCASV	Out	Upper CAS address strobe
102	/LCAS	/LCASV	Out	Lower CAS address strobe
103	/WE	/WEV	Out	Write enable
104	MD15	MD15	I/O	Memory data
105	MD14	MD14	I/O	Memory data
106	MD13	MD13	I/O	Memory data
107	MD12	MD12	I/O	Memory data
108	MD11	MD11	I/O	Memory data
109	MD10	MD10	I/O	Memory data
110	GND	GND	In	GND
111	VDD	VCC	In	+5V
112	MD9	MD9	I/O	Memory data
113	MD8	MD8	I/O	Memory data
114	MD7	MD7	I/O	Memory data

Pin No.	Symbol	Signal name	In/ Out	Function
115	MD6	MD6	I/O	Memory data
116	MD5	MD5	I/O	Memory data
117	MD4	MD4	I/O	Memory data
118	MD3	MD3	I/O	Memory data
119	MD2	MD2	I/O	Memory data
120	MD1	MD1	I/O	Memory data
121	MD0	MD0	I/O	Memory data
122	GND	GND	In	GND
123	VDD	VCC	In	+5V
124	RESET	RESET	In	Reset signal
125	MINTEST	GND	In	GND
126	TEST	GND	In	GND
127	GND	GND	In	GND
128	XO	XO	Out	25.175MHz

2-9. CKDC9 (HD404728A91FS)

1) General description

The CKDC7 is a 4-bit microcomputer developed for the UP-3300 and provides functions to control the real-time clock, keys, and displays. The basic functions of the CKDC7 are shown below.

Keys: The CKDC9 is capable of controlling a maximum of 256 momentary keys. (Sharp 2-key rollover control)
Simultaneous scanning of key and switch
(When a key is scanned, the state of a mode and clerk switch is also buffered. The host can scan the state of switch together with the key entry data at the same time the key is scanned.)

Switches: Mode switch with 14 positions maximum
8-bit clerk (cashier) switch
2-bit feed switch
1-bit receipt on/off switch
1-bit option switch
4-bit general-purpose switch (1-bit is used for keyboard select)

Displays: 16-column dot display
12-column 7-segment display (column digit selectable)
All column blink controlled for the dot and 7-segment display decimal point and indicators
Programmable patterns for 7-segment display:
Four patterns
Internal driver for 7-segment display

Buzzer: Single tone control

Clock: Year, month, day of month, day of week, hour, minute

Alarm: Hour, minute

Interrupt request (event control):
Detection of key input, switch position change, alarm issue, and counter overflow

2) Pin description

Pin No.	Symbol	Signal name	In/ Out	Function
1	SB	SB	Out	Segment B
2	SC	SC	Out	Segment C
3	SD	SD	Out	Segment D
4	SE	SE	Out	Segment E
5	SF	SF	Out	Segment F
6	SG	SG	Out	Segment G
7	P4	AP	Out	
8	P0	NC	—	NC
9	P1	NC	—	NC
10	P2	DP	Out	Decimal point
11	P3	ID	Out	Indicator
12	$\overline{\text{MODR}}$	VCC	—	+5V
13	$\overline{\text{CFSR}}$	$\overline{\text{CFSR}}$	In	Clerk key, Feed key, Switch return signal
14	KEX0	NC	Out	NC
15	KEX1	NC	Out	NC
16	RQ	GND	—	GND
17	SKR0	VCC	—	+5V
18	ST0	ST0	Out	Key strobe signal
19	ST1	ST1	Out	Key strobe signal
20	ST2	ST2	Out	Key strobe signal
21	ST3	ST3	Out	Key strobe signal
22	$\overline{\text{POFF}}$	$\overline{\text{POFF}}$	In	Power off signal
23	$\overline{\text{STOP}}$	$\overline{\text{STOP}}$	In	STOP signal
24	$\overline{\text{DDIG}}$	VCC	—	+5V
25	$\overline{\text{DCS}}$	$\overline{\text{DCS}}$	—	Dot display controller chip select $\overline{\text{DCS}}$
26	VCC	$\overline{\text{VCKDC}}$	—	+5V
27	$\overline{\text{SCK}}$	$\overline{\text{SCK}}$	In	Clock signal
28	HTS	HTS	In	Key data from host
29	STH	STH	Out	Key data to host
30	SDISP	GND	—	GND
31	BUZZ	BUZZ	Out	Buzzer
32	$\overline{\text{DSCK}}$	$\overline{\text{DSCK}}$	—	Dot display controller $\overline{\text{SCK}}$
33	$\overline{\text{SRES}}$	$\overline{\text{RESET}}$	Out	Reset signal
34	DS0	$\overline{\text{DSO}}$	—	Dot display controller SO
35	$\overline{\text{SHEN}}$	$\overline{\text{SHEN}}$	Out	Shift enable signal
36	$\overline{\text{IRQ}}$	$\overline{\text{KRQ}}$	Out	Key request signal
37	KR0	$\overline{\text{KR0}}$	In	Key return signal
38	KR1	$\overline{\text{KR1}}$	In	Key return signal
39	KR2	$\overline{\text{KR2}}$	In	Key return signal
40	KR3	$\overline{\text{KR3}}$	In	Key return signal
41	RESET	CKDCR	In	CKDC reset signal
42	OSC2	OSC2	—	Clock
43	OSC1	OSC1	—	Clock
44	GND	GND	—	GND
45	CL1	CL1	—	Time clock
46	CL2	CL2	—	Time clock
47	TEST	VCKDC	—	+5V
48	G0	G1	Out	Display digit signal
49	G1	G2	Out	Display digit signal
50	G2	G3	Out	Display digit signal
51	G3	G4	Out	Display digit signal
52	G4	G5	Out	Display digit signal
53	G5	G6	Out	Display digit signal
54	G6	G7	Out	Display digit signal
55	G7	G8	Out	Display digit signal
56	G8	G9	Out	Display digit signal
57	G9	G10	Out	Display digit signal
58	G10	G11	Out	Display digit signal
59	G11	NC	Out	NC
60	PO0	NC		NC
61	PO1	NC		NC
62	PO2	NC	—	NC
63	PO3	NC	—	NC
64	SA	SA	—	Segment A

2-10. ISP2032

This IC has been developed specially for UP-3300 to achieve VGA CHIP and PSRAM interfaces.

Pin descriotion

Pin No.	Name	I/O	Function
1	/VMEM	In	VIDEO MEMORY DECODE C00000H ~ C1FFFFH 16bit/8bit access, 8 bit read from the CPU is treated as 16-bit on the VGA.
2	/VMEM2	In	VIDEO MEMORY DECODE (ONLY FOR GRAPHICS MODE; 8BIT) C80000H ~ C9FFFFH 8-bit access only. /VMEM and /VMEM2 differ in their apparent address to each other, but the contents of memory to be accessed are the same. They differ in access method (WORD/BYTE).
3	/HWR	In	HIGH BYTE WRITE FROM CPU
4	/LWR	In	LOW BYTE WRITE FROM CPU
5	PHAI	In	CLOCK FROM CPU
6	VCC		
7	/ISPEN	In	for ISP (In System Program)
8	/VWAITI	In	WAIT FROM VGA CHIP (IOCHRDY)
9	/VWAIT	Out	WAIT TO MPCA There are following 2 ORs. ① IOCHRDY from VGA CHIP ② 1 WAIT is generated when VRAM. VGA I/O is accessed. (Because IOCHRDY is slow, 1 WAIT is generated prior to it.)
10	/DWRI	In	DELAYED WRITE (FOR VGA CHIP TIMING)
11	/DWRO	Out	WRITE FOR /DWRI
12	/DRDI	In	DELAYED READ (FOR VGA CHIP TIMING)
13	/DRD	Out	READ FOR /PRDI
14	RES	Out	RESET OUTPUT RESET ←NOT (/RESET)
15	/RES	In	/RESET INPUT
16	A0	In	A0
17	GND		
18	A20	In	A20
19	PCE21E	Out	EXTENDED PSRAM1 DECODE (EVEN) 800000H ~ 8FFFFFH
20	PCE210	Out	EXTENDED PSRAM1 DECODE (ODD) 800000H ~ 8FFFFFH
21	PCE220	Out	EXTENDED PSRAM2 DECODE (ODD) 900000H ~ 9FFFFFH
22	PCE22E	Out	EXTENDED PSRAM2 DECODE (EVEN) 900000H ~ 9FFFFFH
23	/IPLON0	In	IPL SIGNAL
24	/PSRF0	Out	PSRAM REFRESH
25	/OWR	Out	PSRAM WRITE (ODD SIDE)
26	/M3SWP	Out	MODE3 BUS SWAP (FOR PSRAM ACCESS WHEN IPL)
27	Y2/SCLK		ISP
28	VCC		
29	Y1/RESET		ISP
30	MODE		ISP
31	RASPN2E	In	EXTENDED PSRAM2 DECODE (FROM MPCA) 800000H ~ 9FFFFFH
32	RASPN2	In	EXTENDED PSRAM2 DECODE (FROM MPCA) 800000H ~ 9FFFFFH
33	/RASPN12	In	PSRAM DECODE (FROM MPCA) 600000H ~ 9FFFFFH
34	/AS	In	/AS FROM CPU
35	/RD	In	/RD FROM CPU
36	/RFSH	In	/RFSH FROM CPU
37	/SMEMR	Out	VIDEO MEMORY READ (TO VGA CHIP)
38	/SMEMW	Out	VIDEO MEMORY WRITE (TO VGA CHIP)
39	GND		
40	/COE0		Not used
41	/IORD	Out	VGA IO READ (TO VGA CHIP)
42	/IOWR	Out	VGA IO WRITE (TO VGA CHIP)
43	/SBHE	Out	BUS HIGH ENABLE (TO VGA CHIP)
44	/VIO2	Out	VGA IO CHIP SELECT

3. Address map

3-1. Total memory space

The address map of the total memory space is shown below. As you can see, the memory space is divided into the following 5 blocks:

- 0page area (including the I/O area)
- VRAM
- RAM
- ROM
- Extended I/O area

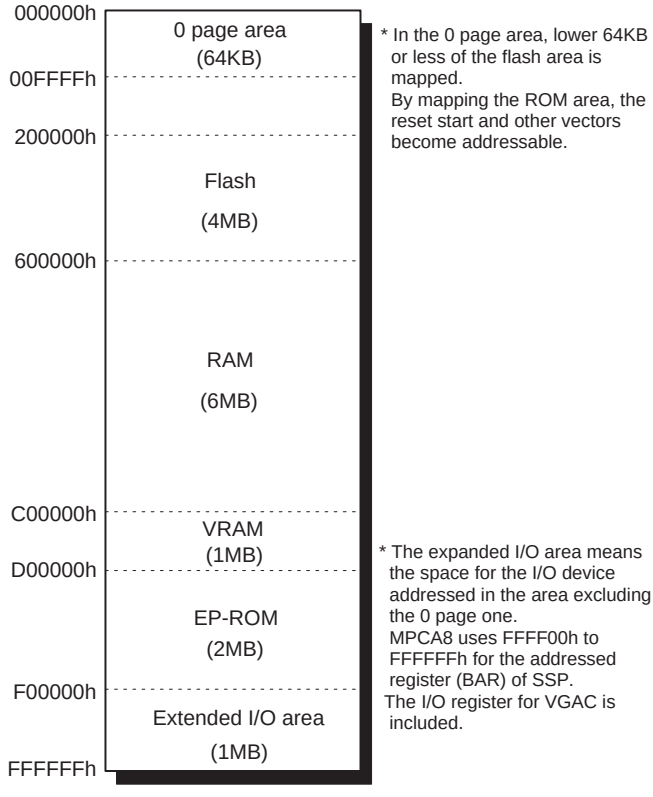


Fig. 2

3-2. 0page area

The 0page area consists of four spaces: the ROM mapped area, internal and external I/O areas.
The ROM mapped space have been devised for the following purposes:

① Simplifying the procedure for booting the IPL program

② Achieving high-speed accessing, and accessing by abbreviated instructions.

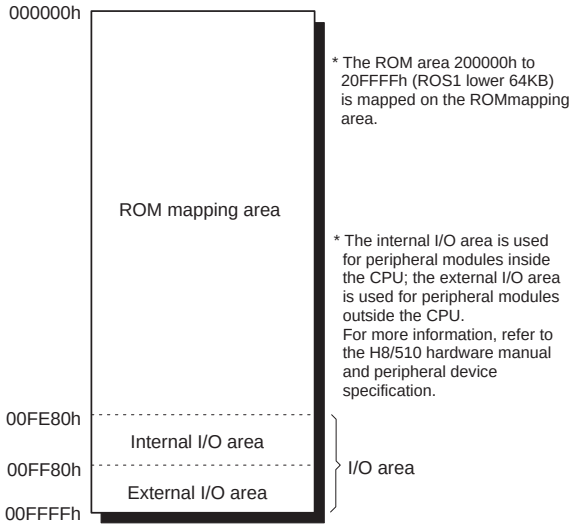

000000h
ROM mapping area
00FE80h
Internal I/O area
00FF80h
External I/O area
00FFFFh
I/O area
* The ROM area 200000h to 20FFFFh (ROS1 lower 64KB) is mapped on the ROMmapping area.
* The internal I/O area is used for peripheral modules inside the CPU; the external I/O area is used for peripheral modules outside the CPU.
For more information, refer to the H8/510 hardware manual and peripheral device specification.

Fig. 3

3-3. I/O areas

The addresses from 00FF80h to 00FFFFh are called the internal I/O area.
The internal I/O area is a space where the control registers and built-in ports inside the CPU are addressed.
The external I/O area is a space where the peripheral devices outside the CPU or devices on an optional card are addressed.

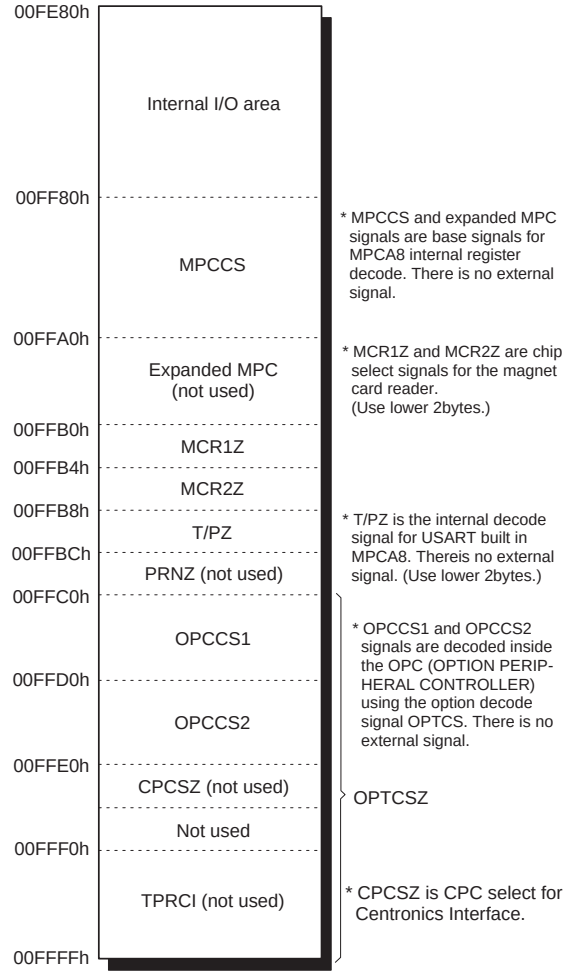

00FE80h
Internal I/O area
00FF80h
MPCCS
00FFA0h
Expanded MPC (not used)
00FFB0h
MCR1Z
00FFB4h
MCR2Z
00FFB8h
T/PZ
00FFBCh
PRNZ (not used)
00FFC0h
OPCCS1
00FFD0h
OPCCS2
00FFE0h
CPCSZ (not used)
Not used
00FFF0h
TPRCI (not used)
00FFFFh
OPTCSZ
* MPCCS and expanded MPC signals are base signals for MPCA8 internal register decode. There is no external signal.
* MCR1Z and MCR2Z are chip select signals for the magnet card reader.
(Use lower 2bytes.)
* T/PZ is the internal decode signal for USART built in MPCA8. Thereis no external signal. (Use lower 2bytes.)
* OPCCS1 and OPCCS2 signals are decoded inside the OPC (OPTION PERIPHERAL CONTROLLER) using the option decode signal OPTCS. There is no external signal.
* CPCSZ is CPC select for Centronics Interface.

Fig. 4

3-4. ROM space

Fig.5 shows the ROM space. The UP-3300 uses 2MB of NOR-type flash memory instead of conventional ROM, so that the ROS1 from the MPCA8 is input into the chip enable of the flash memory.

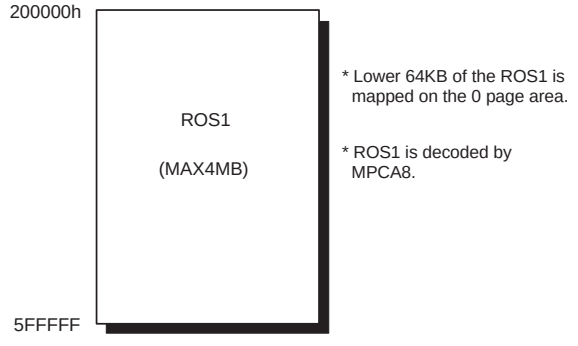


Fig. 5

3-5. VRAM & RAM space

The VRAM is the display memory of the LCD.

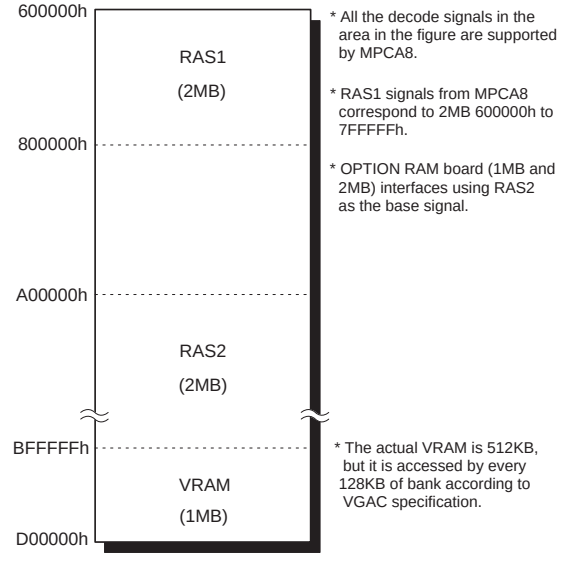

600000h
RAS1
(2MB)
800000h
A00000h
RAS2
(2MB)
BFFFFFh
VRAM
(1MB)
D00000h
* All the decode signals in the area in the figure are supported by MPCA8.
* RAS1 signals from MPCA8 correspond to 2MB 600000h to 7FFFFFh.
* OPTION RAM board (1MB and 2MB) interfaces using RAS2 as the base signal.
* The actual VRAM is 512KB, but it is accessed by every 128KB of bank according to VGAC specification.

Fig. 6

3-6. Extended I/O area

The addresses from F00000h to FFFFFFh are called an extended I/O area. The UP-3300 uses the following addresses as the break address register (BAR) for SSP.

- FFFF00h ~ FFFFFFh

4. LCD display

The main display is a 640 × 480 dot liquid crystal display.

4-1. Block diagram

Here is the block diagram of the LCD and its allied components.

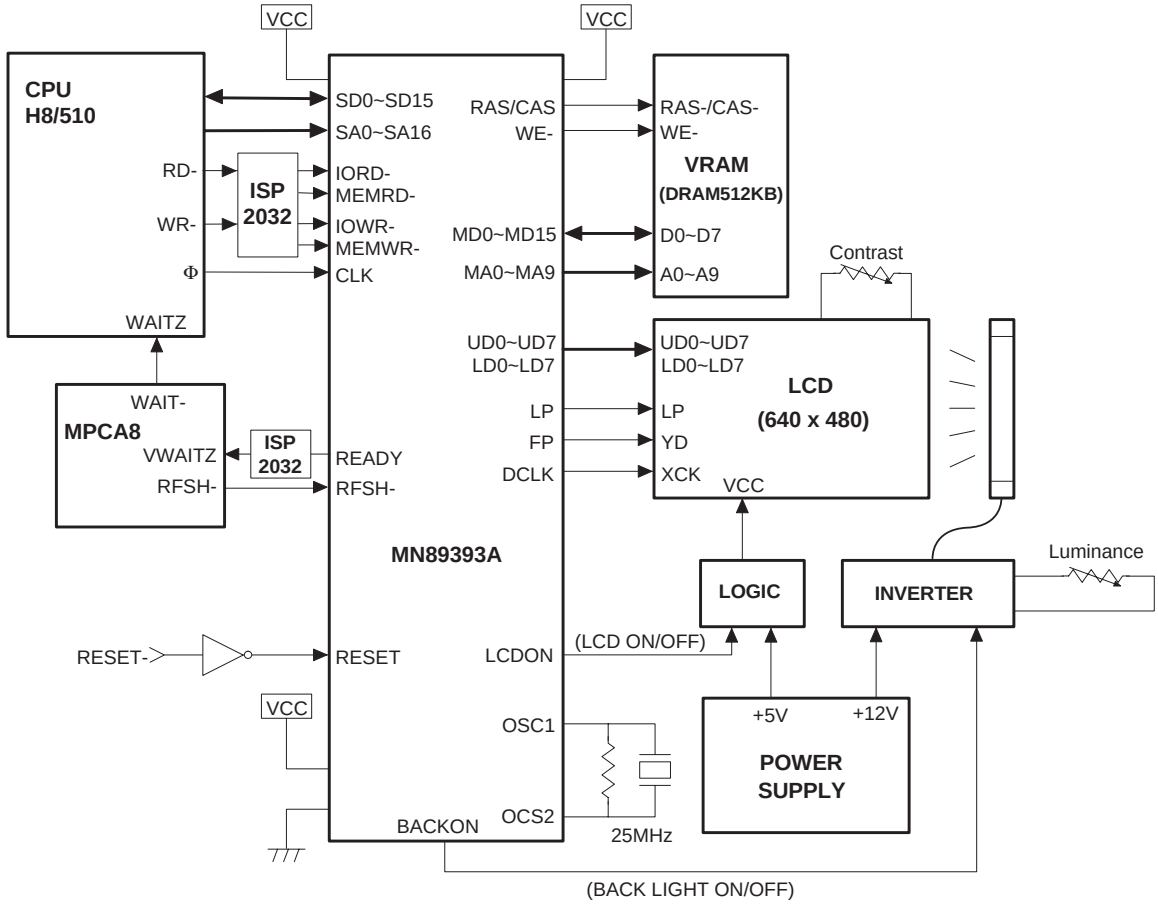


Fig. 7

4-2. LCD panel

The dot-matrix LCD unit LM10V33 with color STN and CCFT back light is used for LCD panel. It provides 640 ×480 resolution.

4-3. Display controller

Matsushita VGAC (MN89303A) is used for display controller.

VRAM is on the address space of the CPU and data can be written on and read from it by every 128 KB of bank at the address C00000H ~ C1FFFFH from the CPU side. VRAM consists of 4 banks.

4-4. LCD ON control

The LCD's is bias power supply is controlled by the MN89303A terminal LCDON to turn the LCD screen on and off.

The LCDON is at "L" at resetting +5V power is supplied to the LCD by setting the expanded function control register bit5 of MN89303A to "H" with software. The LCD screen isn't turned on until +5V is supplied.

4-5. Back light control

The back light is turned ON/OFF by the MN89303A terminal BACKON. The initial value is "L" and the back light is off. By setting the expanded function control register bit6 of MN89303A to "H", the inverter unit is turned on.

4-6. Luminance and contrast adjustment

- Luminance: Luminance is adjusted with an inverter which has dimming function.
- Contrast: Contrast is adjusted by controlling the contrast adjustment voltage (VCON) of the LM10V33.

5. Customer display

The customer display uses the NEW TYPE 2 LINE vacuum fluorescent tube. The display is turned on and off by the CKDC9.

6. Pseudo SRAM (Standard)

The device is TOSHIBA 4MB SRAM (TC51V8512AFT 512K × 8bit) with access time of 120ns.

6-1. CPU interface

The figure below shows a typical pseudo SRAM interface in the up-3300.

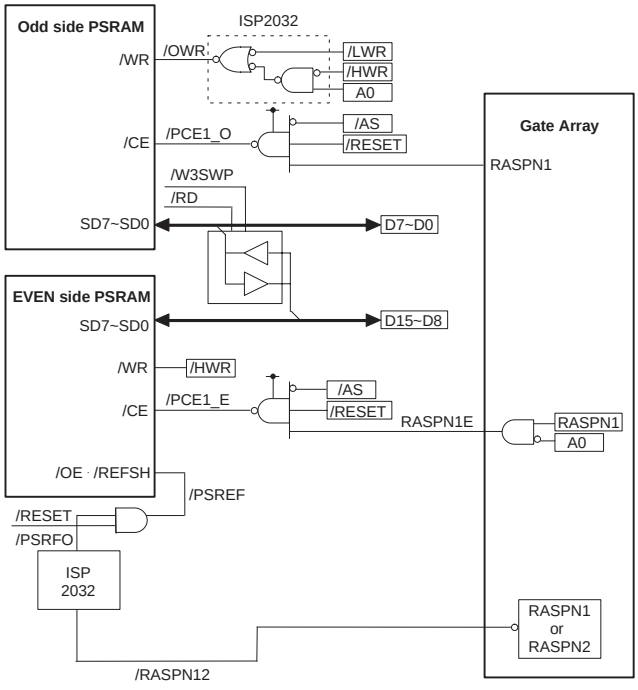


Fig. 8

6-2. Pseudo SRAM address

Standard pseudo SRAM is decoded as follows by the RASPN1 signal.

① 700000h ~ 7FFFFFh

The base signal is 2MB. It thus wraparounds with 600000H ~ 6FFFFFH 1MB.

Pseudo SRAM consists of 1 chip for respective even and odd number addresses. Both of word and byte access from CPU are available.

7. NOR-type flash memory

Here is the explanation for the interface of NOR-type flash memory. The device is Sharp's LH28F016SU flash memory which consists of 512 K words × 16 or 1 MB × 8, with 16 blocks of 64 KB.

7-1. CPU interface

The figure below shows a typical interface for the LH28F016SU of the up-3300 system.

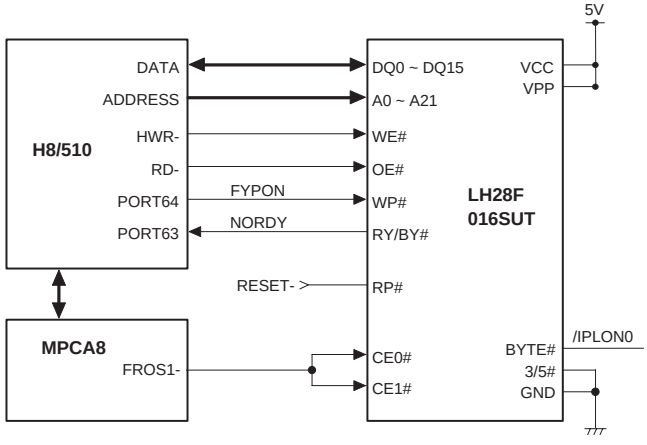


Fig. 9

7-2. Device control

After resetting, the device automatically enters the array read mode and perform the same action as the usual ROM, thus requiring no special consideration when reading data.

Data can be written at high speed by using the page buffer.

8. SSP control

The UP-3300 uses flash memory in the place of EPROM, so it is possible to rewrite the contents of the flash memory in changing the program. However, since the existing gate array MPCA8 is used, it is also possible to use the conventional SSP.

8-1. Operation

Like the MPCA7, the MPCA8 adopts the break address register comparison method for detecting addresses. The operation of this method is briefly explained below.

The gate array always compares the break address register (BAR) built in the gate array, with the address bus to monitor the address bus.

If both agree, the gate array outputs the NMI signal to the CPU, which in turn shifts from normal handling to exception handling.

In both the MPCA7 and the MPCA8, SSP is achieved by the above operation.

The setting of the break address register (BAR) is directly written in the addresses from FFFF00h to FFFFFFh.

9. Interrupt control

There are roughly two types of interrupts:

- Internal interrupts: Controlled inside the CPU
- External interrupts: Input into the CPU from outside

9-1. Internal interrupts

Device interrupts built in the CPU are used for the following applications:

Table 8

Event factor		Application
SC11		Interrupt source as IR channel
SC12		Not used (SC1 is used for CKDC interface.)
FRT1	(ICI) (OCRA) (OCRB) (OVF)	INTMCR ~ MCR interrupt (to FT11 terminal)
FRT2	(ICI) (OCRA) (OCRB) (OVF)	Standard SHEN event (for CKDC) Simple IRC timer event RS232 timer event System timer (53 ms)
TMR	(CMA) (CMB) (OVF)	
WDT	(OVF)	Drawer open timer
A/D		Not used
NMI		SSP request

9-2. External interrupts

The following types of external interrupts are available:

- $\overline{\text{NMI}}$ (SSP)
- $\overline{\text{IRQ0}}$ (Standard I/O interrupt)
- $\overline{\text{IRQ1}}$ (RS232 interrupt)
- $\overline{\text{IRQ2}}$ (Used as SCk terminal)
- $\overline{\text{IRQ3}}$ (Used as SCK terminal)

10. WAIT control

The weight control function built in the MPCA8 is used to provide an interface with low-speed devices.

10-1. Block diagram

The block diagram of the wait control function is shown.

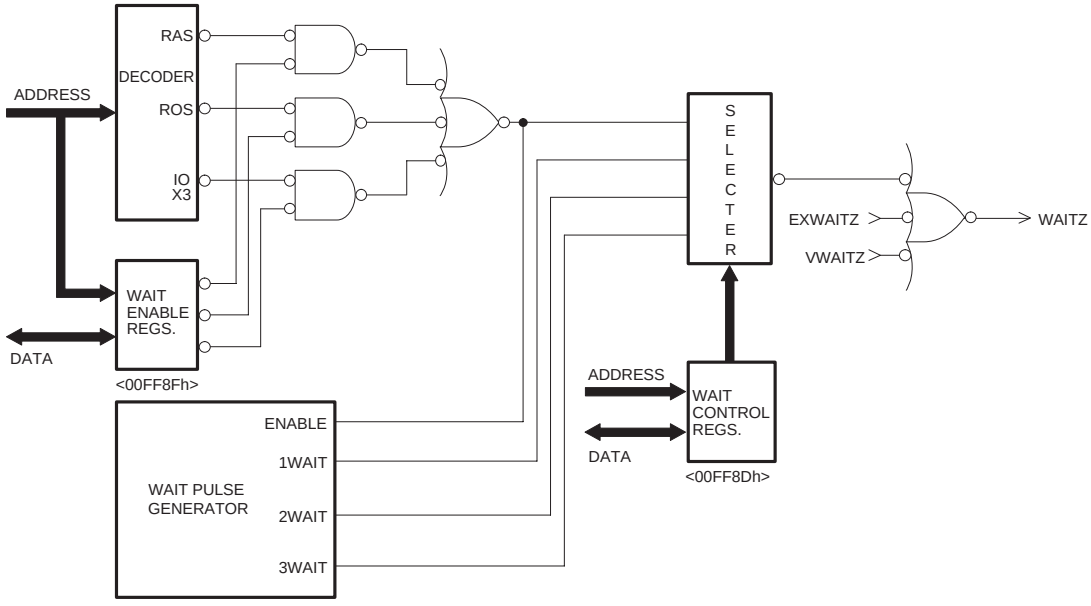


Fig. 10

In the figure, the decoder, wait enabling register, AND-OR sections are the same as those in the MPCA6 or 7, but other components are newly incorporated in the MPCA7.

EXWAITZ and WAITZ are external weight signals which are to be ORed inside the MPCA8 and output to the WAITZ. The EXWAITZ is a general-purpose wait request terminal, and WAITZ is the wait request signal from the VGA controller.

11. CKDC9

The UP-3300 performs the following controls, using CKDC9.

- Customer display
- Clock
- Buzzer
- System reset

11-1 Interface

CKDC9 is connected through the MPCA8.

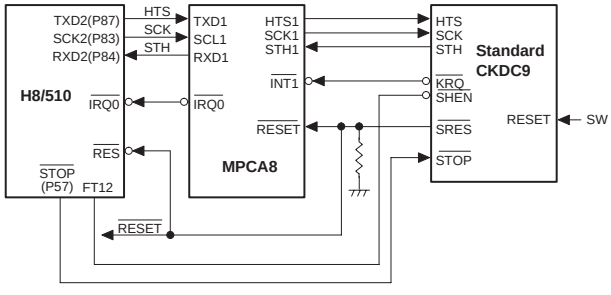


Fig. 11

12. Option RAM interface

12-1. Interface

The expanded RAM connector terminals are shown in the table.

The 72 pin S.O. DIMM is used for the connector.

Extension RAM connector terminals

Signal Name	Pin No.	Signal Name	Pin No.	Signal Name	Pin No.
GND	1	—	25	D9	49
GND	2	—	26	D8	50
—	3	—	27	D7	51
—	4	—	28	D6	52
—	5	A13	29	D5	53
—	6	A12	30	D4	54
—	7	A11	31	D3	55
—	8	A10	32	D2	56
—	9	A9	33	D1	57
—	10	A8	34	D0	58
A14	11	A7	35	GND	59
A15	12	A6	36	NC	60
A16	13	A5	37	$\overline{\text{OWR}}$	61
A17	14	A4	38	—	62
A18	15	A3	39	—	63
A19	16	A2	40	—	64
—	17	A1	41	—	65
$\overline{\text{PCE22\_E}}$	18	A0	42	—	66
$\overline{\text{PCE21\_E}}$	19	D15	43	$\overline{\text{HWR}}$	67
—	20	D14	44	—	68
$\overline{\text{PSREF}}$	21	D13	45	VMEM	69
$\overline{\text{PCE22\_O}}$	22	D12	46	VMEM	70
$\overline{\text{PCE21\_O}}$	23	D11	47	GND	71
GND	24	D10	48	GND	72

13. Reset sequence

The reset sequence block diagram is shown below. Note that $\overline{\text{RESET}}$ signal (system reset) and $\overline{\text{CKDCR}}$ signal (CKDC reset) are different from each other.

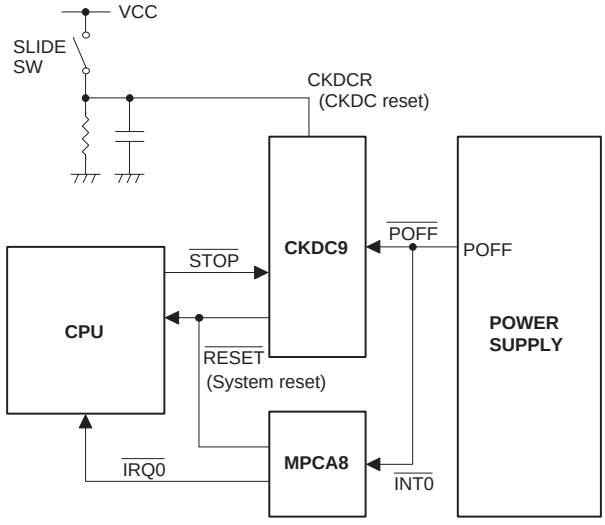


Fig. 14

13-1. Power ON/OFF

The flow of signal processing at the time of the power supply turning On/Off is as follows:

Table 19

<Power OFF>

	Power supply	MPCA8	CPU	CKDC9
1	$\overline{\text{POFF}} \rightarrow$ L			
2		$\overline{\text{IRQ0}} \rightarrow$ L		
3			$\overline{\text{STOP}} \rightarrow$ L	
4				$\overline{\text{RESET}} \rightarrow$ L (System reset)

Table 20

<Power ON>

	Power supply	MPCA8	CPU	CKDC9
1	$\overline{\text{POFF}} \rightarrow$ H			
2				$\overline{\text{RESET}} \rightarrow$ H (System reset)

The table below shows the timing chart.

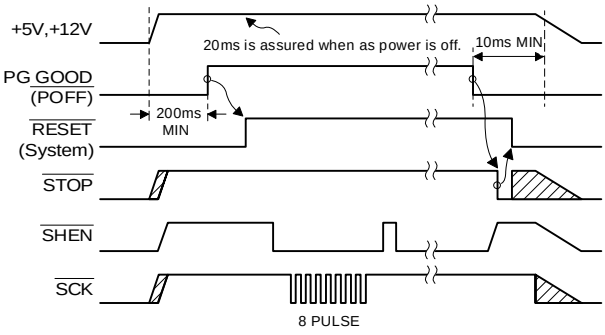


Fig. 15

13-2. MRS, SRV reset

The UP-3300 does not have the mode switch. The procedure for resetting MRS, SRV is different from that of conventional cash registers.

in the UP-3300, MRS, SRV resetting is selected and executed by the key which has bee depressed when the CKDC reset is released to start the system.

(In the case of MRS, security is added by a key operation equivalent to a pass word.)

Flow chart

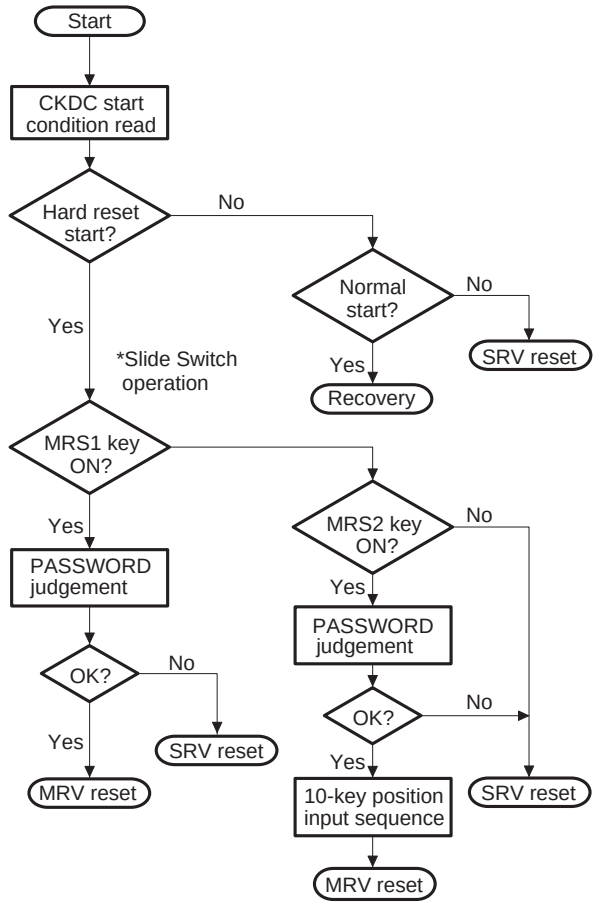


Fig. 16

14. Drawer

The UP-3300 can use up to 2 optional external drawers.

14-1. Drawer solenoid drive

P34 ~ P37 inside the CPU are allocated for the port output of the drawer solenoid drive.

Table 22

Built-in port	Signal name	Remarks
P34	$\overline{\text{DR0}}$	Drawer 1 (optional drawer)
P35	$\overline{\text{DR1}}$	Drawer 2 (optional drawer)
P36	$\overline{\text{DR2}}$	Reserved
P37	$\overline{\text{DR3}}$	Reserved

One port corresponds to one drawer. Theoretically, it is possible to drive multiple drawers at the same time, but this processing must be inhibited softwarewisely because of power supply capacity and driver hardware factors. If a power failure is detected, the drawer solenoid drive must be stopped as soon as possible.

∗ The drawer solenoid drive time must controlled in the range of 40 ms to 50 ms by the timer.

14-2. Drawer open/close sense

The drawer open/close sense signal is input into the built-in port of the CPU. the sense signal of an optional drawer sensor is also wired ORed before inputting.

- P33=1: Any of the drawers is open.

15. IR communication

Data is exchanged with the MPCA8 using the channel 1 (SCI1) of the serial communication interface of the CPU.

15-1 CPU interface and modulator/demodulator

Here is its block diagram.

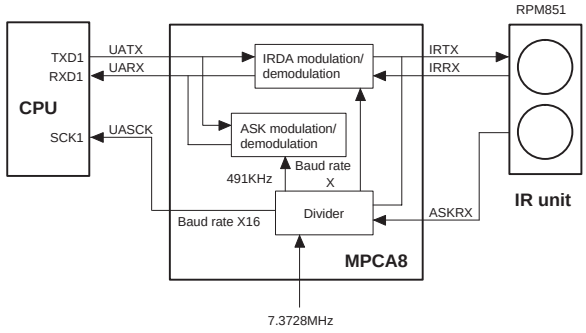


Fig. 20

16. SRN

The SRN of the UP-3300 is compatible with the ER-A750.

17. RS232

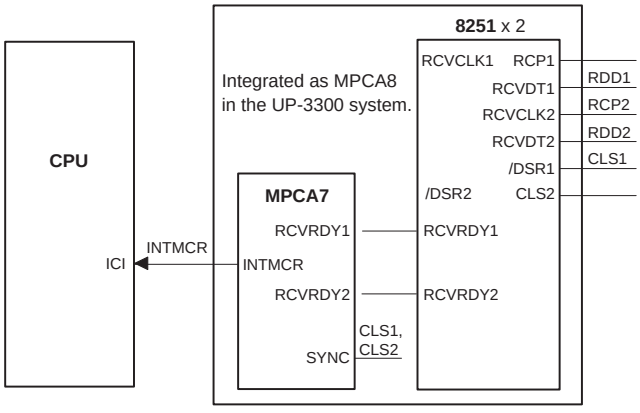
Two standard RS232 channels are compatible with the ER-A5RS. However, while the ER-A5RS uses the $\overline{IRQ2}$ terminal of the CPU for interruption of the RS232, the UP-3300 cannot use the $\overline{IRQ1}$ terminal instead of it. (The $\overline{IRQ2}$ terminal is used for IR as the SCK1 terminal.)
The standard RS232 is fixed to the logic channels 1 and 2. To the built-in printer, logic channel 7 is assigned. Use the channels 3, 4, 5 and 6 for the ER-A7RS.

18. MCR

This paragraph describes MCR option (UP-E12MR2) control defined by UP-3300 hardware architecture.
2 channels of the serial port (interchangeable with 8251) built in the MPCA8 are used. 2 tracks of data are read simultaneously. Supports the first and second tracks MCR of ISO. (UP-E12MR2)

18-1. CPU interface

The CPU interface for the USART (8251) and magnet card reader (MCM-21) in the UP-3300 system is shown below.



Signal description

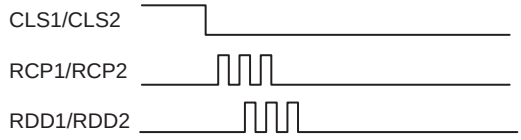
RCP1	TRACK 1 CLOCK PULSE
RDD1	TRACK 1 DATA SIGNAL
RCP2	TRACK 2 CLOCK PULSE
RDD2	TRACK 2 DATA SIGNAL
CLS1	TRACK 1 CARD DETECTION SIGNAL
CLS2	TRACK 2 CARD DETECTION SIGNAL
RCVRDY1	TRACK 1 DATA RECEIVING SIGNAL
RCVRDY2	TRACK 2 DATA RECEIVING SIGNAL
INTMCR	INTERRUPT SIGNAL OR-SYNTHESIZED from RCVRDY and SYNC input

2 chip select signals for 8251 are generated inside MPCA8. The 8251 write recovery time is as follows:

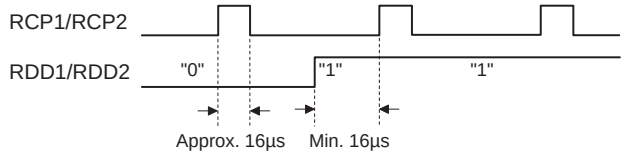
18-2. MCR interface

The operating timing of the MCR interface signals is given below.

(1) Example of timing



(2) Detailed timing (relation between DATA and CLOCK PULSE)



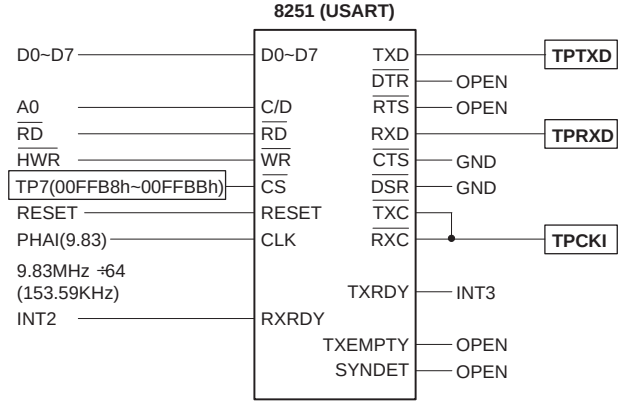
The "NULL" CODE is basically written prior to the opening code. The opening code detection algorithm is considered because data may become corrupt before and after the CARD detection signal due to a worn magnet stripe.

19. Touch panel interface

The 8251 built in the MPCA8 is used as serial communication with the touch panel controller.

8251 (TPZ): Located in 00FFB8h ~ 00FFBBh.

Interrupt: Signal sending interrupt is connected to the INT3.
Signal receiving interrupt is connected to the INT2.

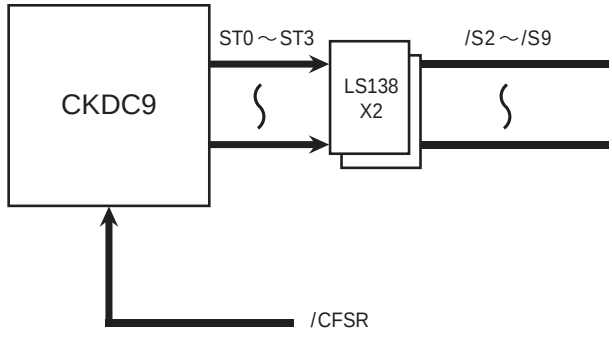


① Duplex type: Full-duplex
② Data rate: 9600 Bps
③ Synchronizing mode: Asynchronous
④ Signal level: TTL
⑤ Data format: 1 Start-bit
8 Data-bit
Stop-bit
Non parity-bit

20. 1-HOLE CLERK

On the UP-3300, 1-hole clerk key with up to 8 bits can be used.

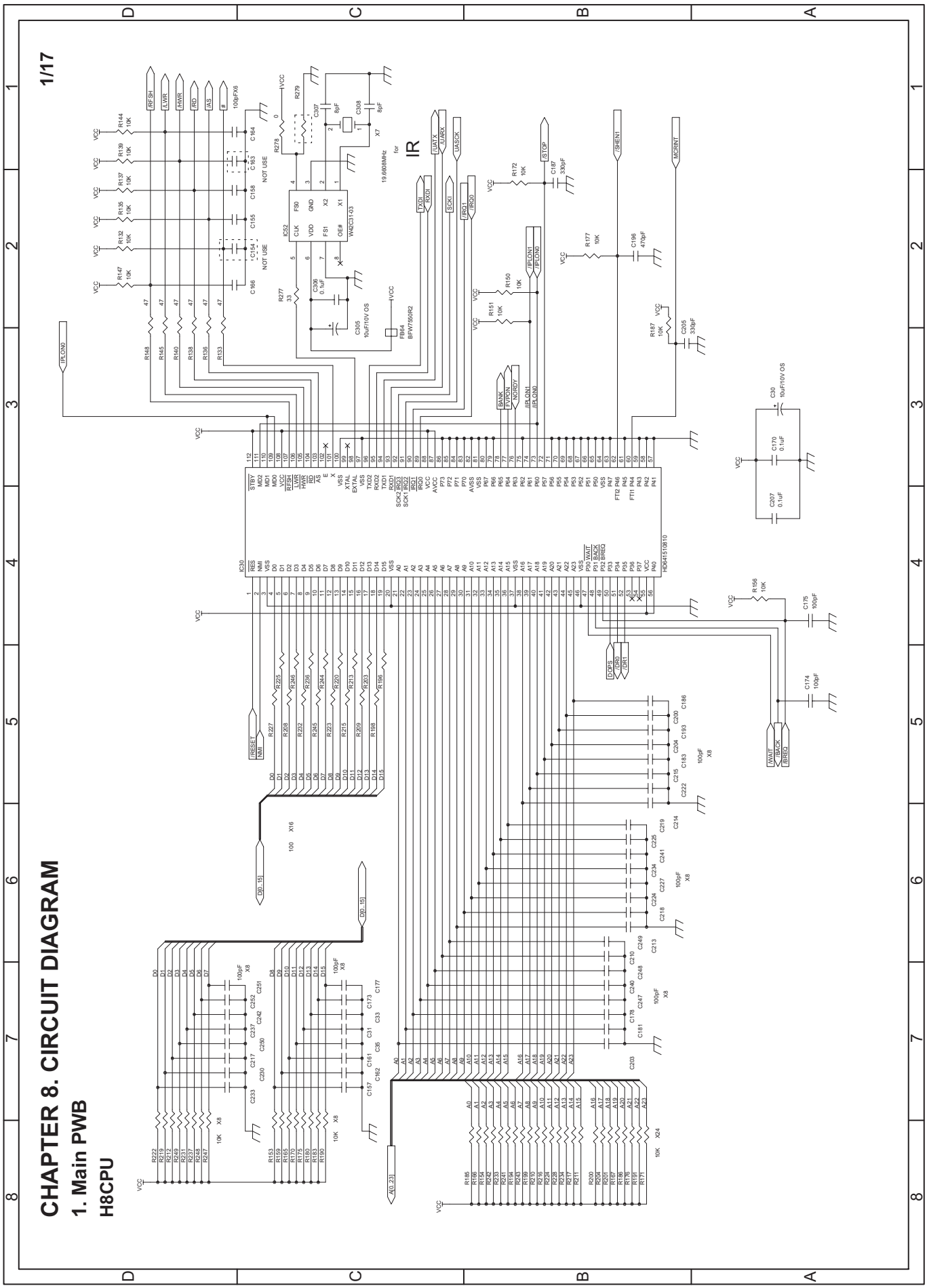
The 1-hole clerk switch is controlled through the CKDC9 on the main board.



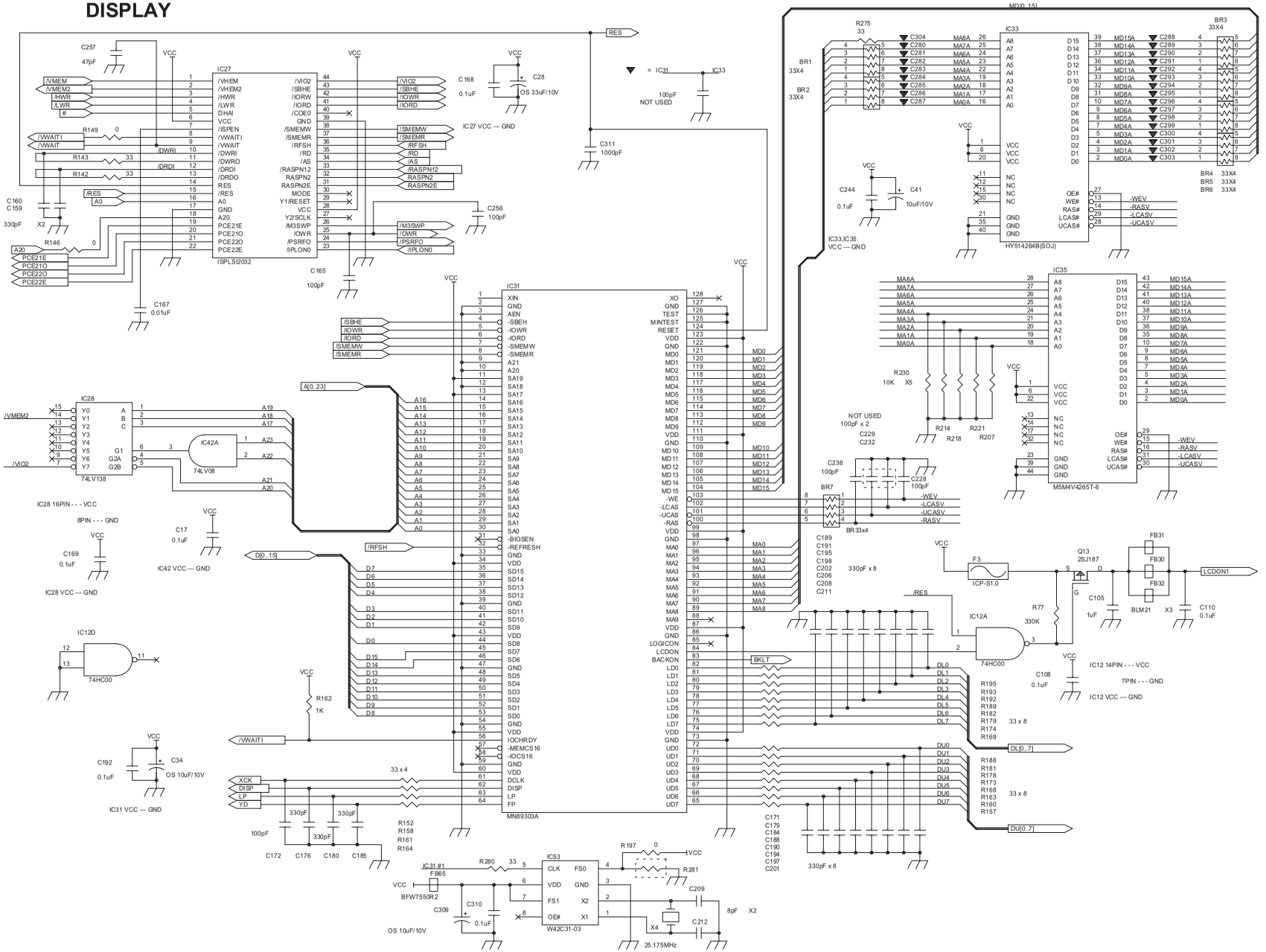
CHAPTER 8. CIRCUIT DIAGRAM

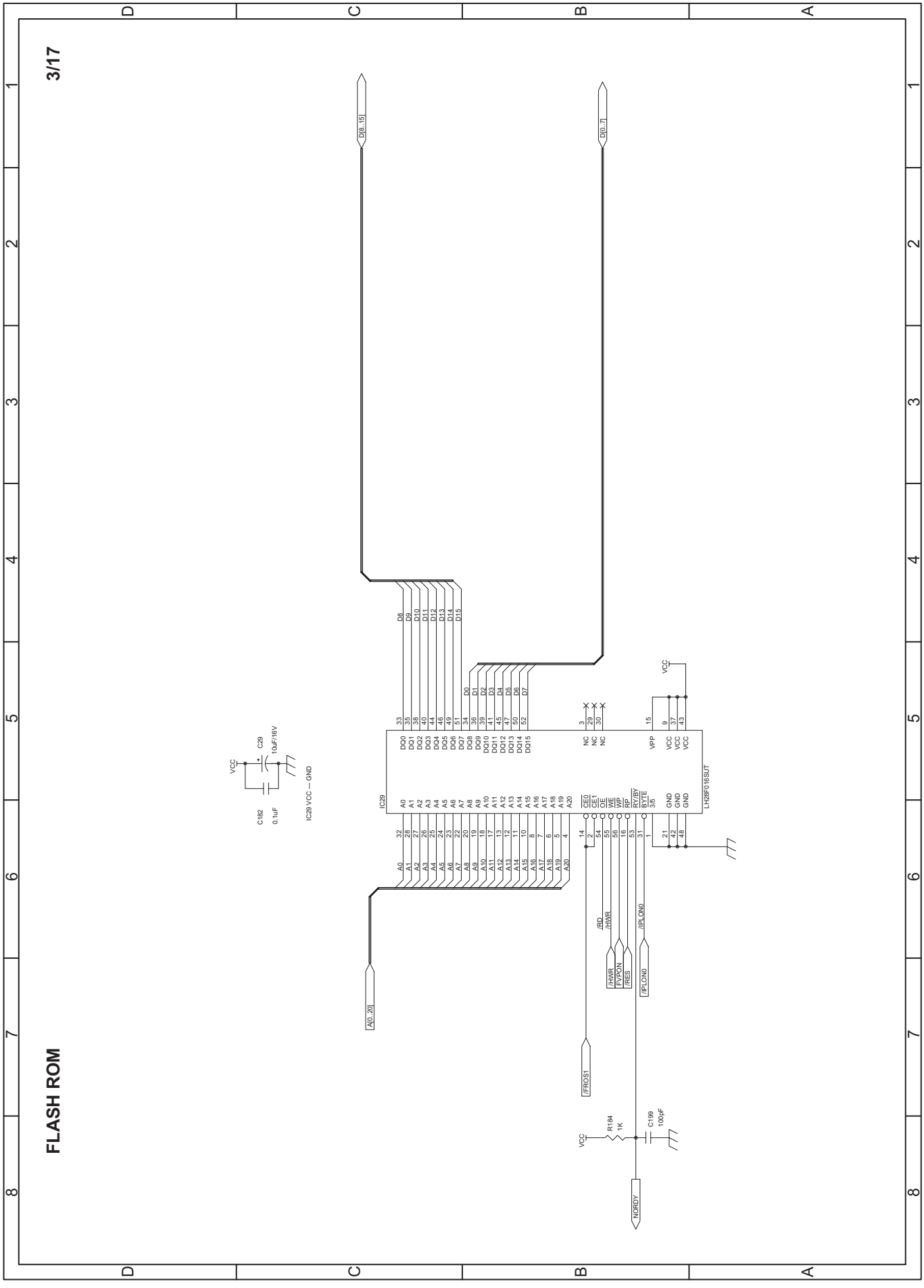
1. Main PWB

H8CPU

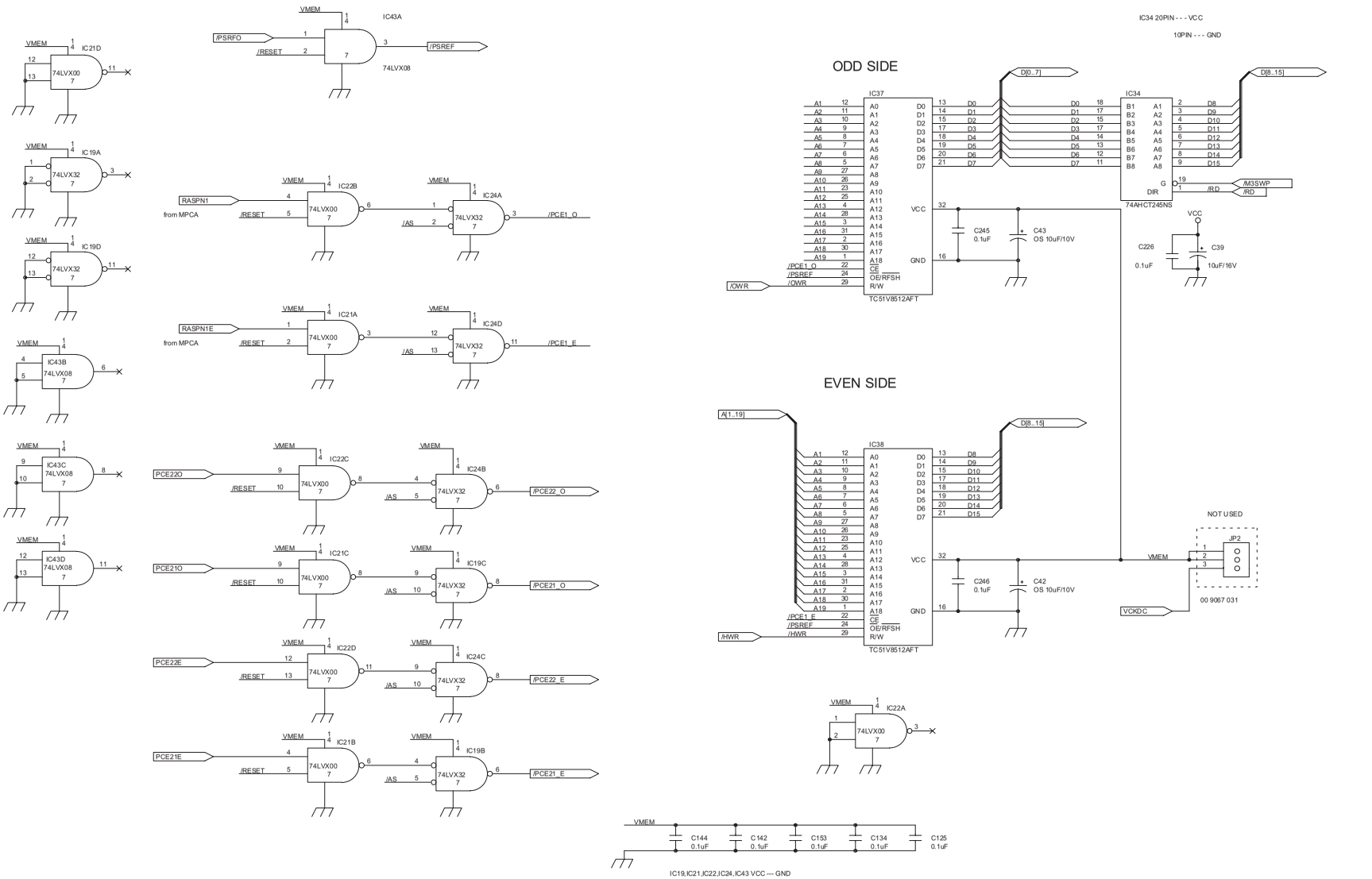


DISPLAY


IC27
ISPLSI2032
IC31
MN89303A
IC33
HY514264B(SOJ)
IC35
M5M4V4265T-6
IC28
74LV138
IC42A
74LV08
IC12A
74HC00
IC12D
74HC00
IC53
W42C31-03
RES
VCC
/VMEM
/VMEM2
/HWR
/LWR
/WAIT1
/WAIT
/DWRI
/DRDI
/RES
A0
A20
PCE21E
PCE21O
PCE22O
PCE22E
/VIO2
/SBHE
/IOWR
/IORD
/SMEMW
/SMEMR
/RFSH
/RD
/AS
/RASPN12
/RASPN2
/RASPN2E
/M3SWP
/OWR
/PSRFO
/IPLON0
A[0..23]
D[0..15]
MD[0..15]
MA[0..8]
BKLT
/WAIT1
XCK
DISP
LP
YD
-WEV
-RASV
-LCASV
-UCASV
LCDON1
DL[0..7]
DU[0..7]
IC31 VCC --- GND
IC27 VCC --- GND
IC28 16PIN - - - VCC
8PIN - - - GND
IC28 VCC --- GND
IC42 VCC --- GND
IC12 14PIN - - - VCC
7PIN - - - GND
IC12 VCC --- GND
IC33,IC35
VCC --- GND
NOT USED
100pF x 2
330pF x 8
33 x 4
33 x 8
100pF
NOT USED
OS 10uF/10V
OS 33uF/10V
25.175MHz
ICP-ST1.0
BLM21


FLASH ROM
3/17
D[8..15]
D[0..7]
VCC
C29
10uF/16V
C182
0.1uF
IC29 VCC -- GND
IC29
LH28F016SUT
DQ0
DQ1
DQ2
DQ3
DQ4
DQ5
DQ6
DQ7
DQ8
DQ9
DQ10
DQ11
DQ12
DQ13
DQ14
DQ15
A0
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10
A11
A12
A13
A14
A15
A16
A17
A18
A19
A20
NC
NC
NC
VPP
VCC
VCC
VCC
GND
GND
GND
CE0
CE1
OE
WE
WP
RP
RY/BY
BYTE
3/5
/A[0..20]
/RD
/HWR
/HWR
FVPON
/RES
/IPLON0
/IPLON0
/FROS1
VCC
R184
1K
C199
100pF
NORDY

PSRAM


IC34 20PIN - - - VCC
10PIN - - - GND
ODD SIDE
EVEN SIDE
IC37
IC38
IC34
TC51V8512AFT
74AHCT245N5
D[0..7]
D[8..15]
A[1..19]
/OWR
/HWR
/PCE1_O
/PCE1_E
/PSREF
/RESET
/AS
VCC
GND
VMEM
C245 0.1uF
C43 OS 10uF/10V
C246 0.1uF
C42 OS 10uF/10V
C226 0.1uF
C39 10uF/16V
C144 0.1uF
C142 0.1uF
C153 0.1uF
C134 0.1uF
C125 0.1uF
IC19,IC21,IC22,IC24,IC43 VCC --- GND
NOT USED
JP2
00 9067 031
VCKDC
/M3SWP
/RD
IC43A
IC21D
IC19A
IC19D
IC43B
IC43C
IC43D
IC22B
IC24A
IC21A
IC24D
IC22C
IC24B
IC21C
IC19C
IC22D
IC24C
IC21B
IC19B
IC22A
/PSRFO
/PSREF
RASPN1
RASPN1E
from MPCA
/PCE1_O
/PCE1_E
PCE22O
PCE21O
PCE22E
PCE21E
/PCE22_O
/PCE21_O
/PCE22_E
/PCE21_E
74LVX00
74LVX08
74LVX32

MPCA8

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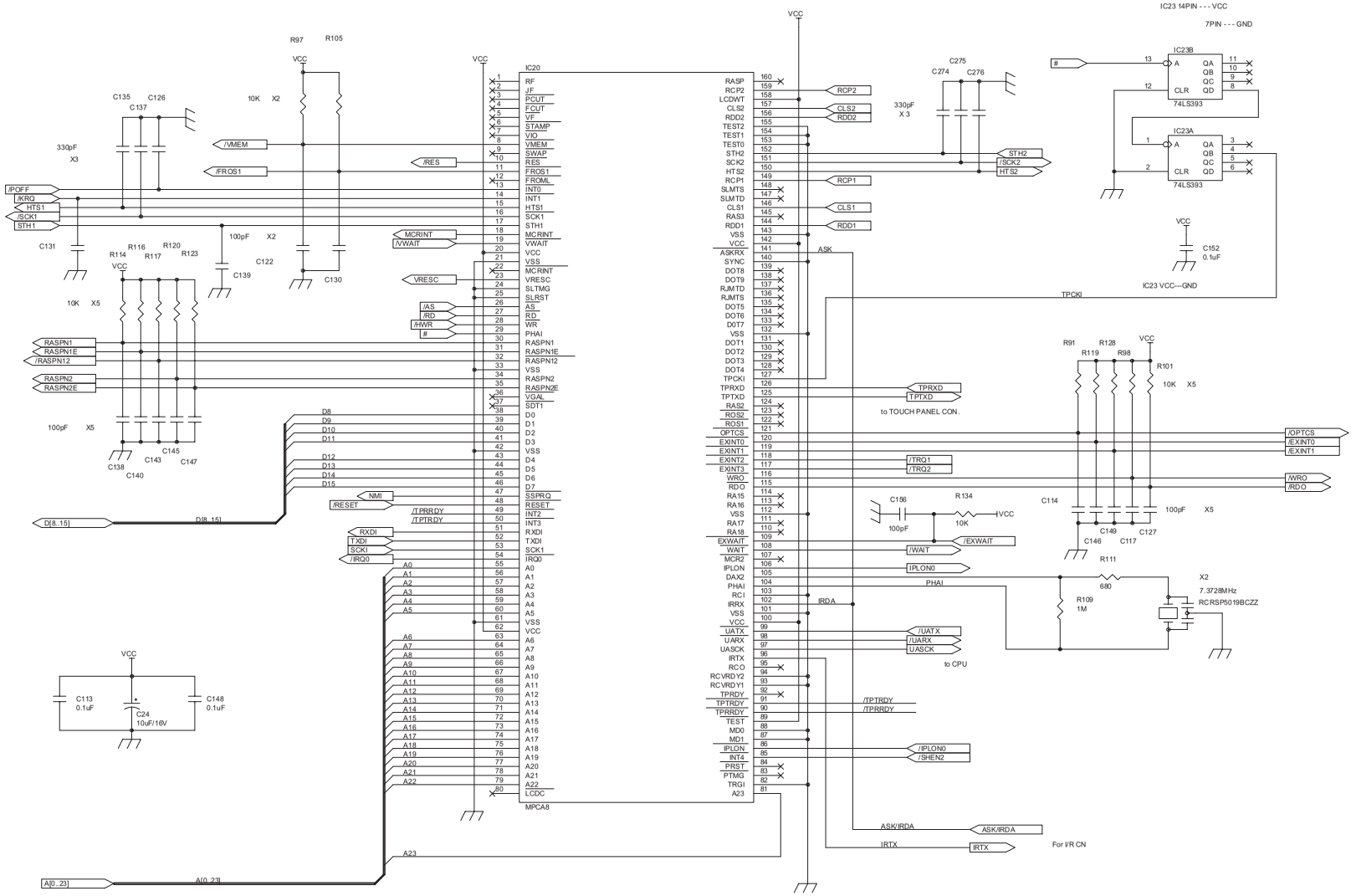
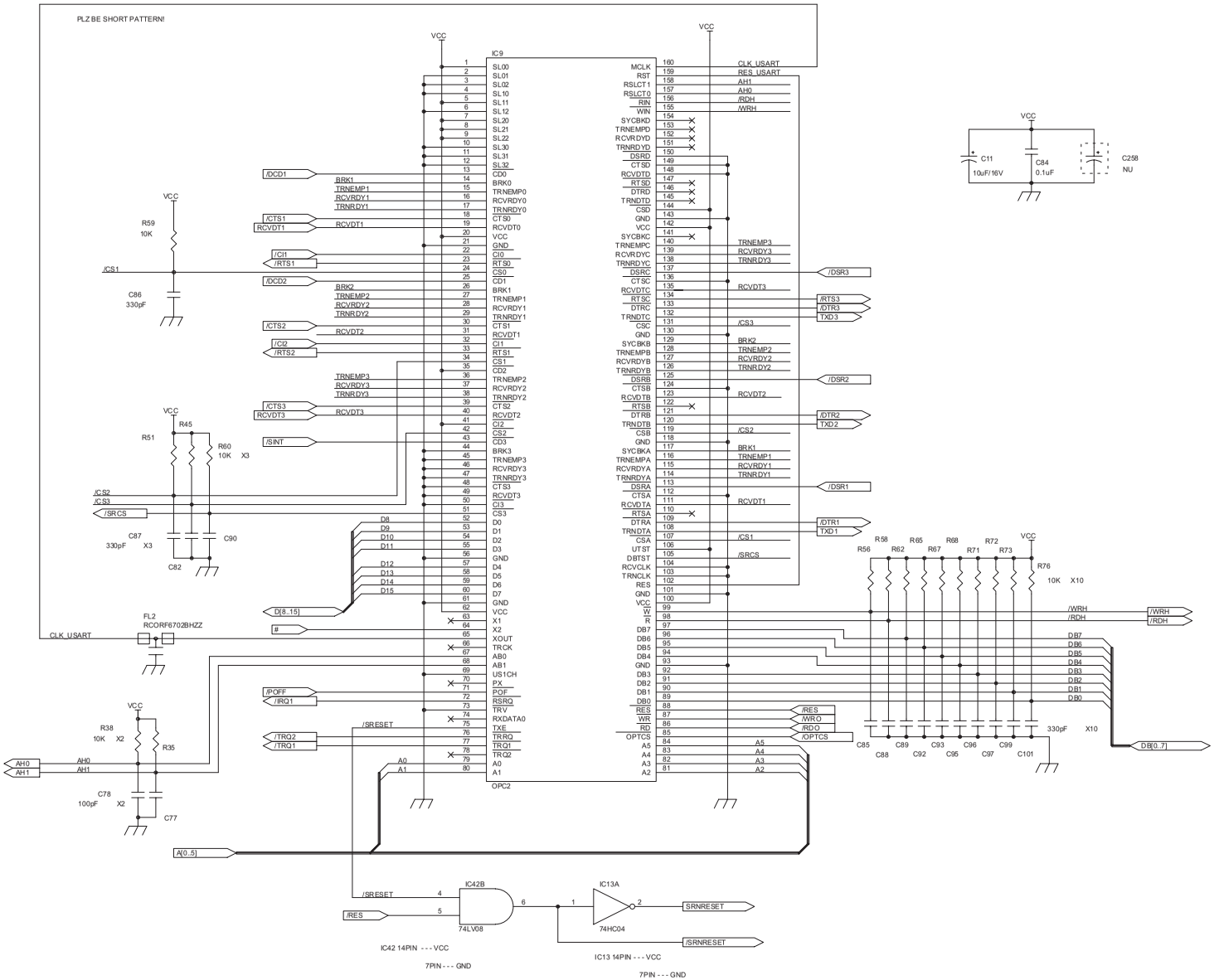
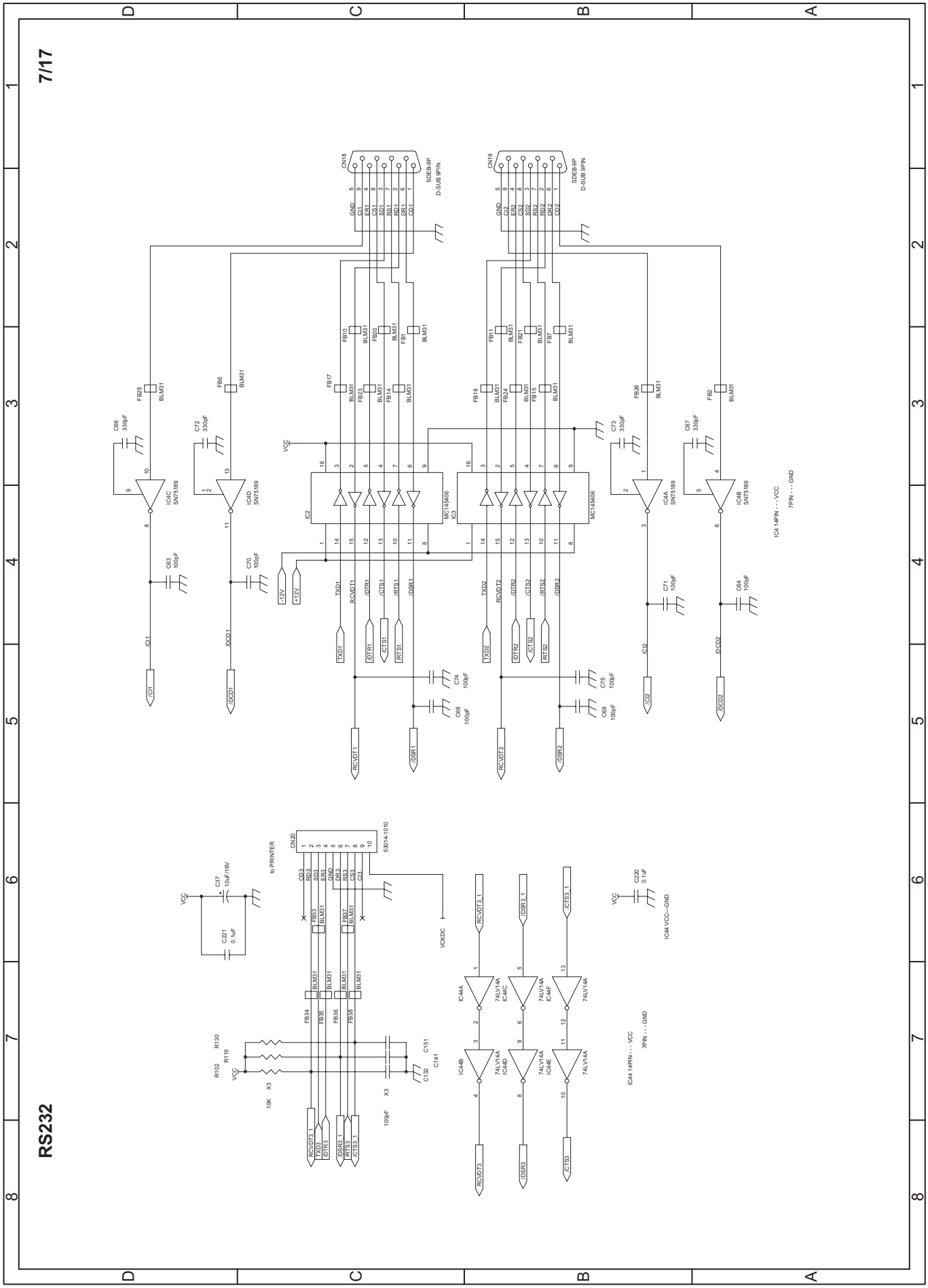

IC20
MPCA8
VCC
R97
R105
10K X2
C135
C126
C137
330pF X3
/VMEM
/FROS1
/RES
/POFF
/KRQ
HTS1
/SCK1
STH1
C131
100pF X2
C122
C139
C130
MCRINT
/VWAIT
VRESC
/AS
/RD
/WR
/
R116
R114
R117
R120
R123
10K X5
RASPN1
RASPN1E
/RASPN12
RASPN2
RASPN2E
100pF X5
C138
C140
C143
C145
C147
D8
D9
D10
D11
D12
D13
D14
D15
D[8..15]
NMI
/RESET
/TPRRDY
/TPTRDY
RXDI
TXDI
SCKI
/IRQ0
A0
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10
A11
A12
A13
A14
A15
A16
A17
A18
A19
A20
A21
A22
A23
A[0..23]
C113 0.1uF
C24 10uF/16V
C148 0.1uF
RASP
RCP2
LCDWT
CLS2
RDD2
TEST2
TEST1
TEST0
STH2
SCK2
HTS2
RCP1
SLMTS
SLMTD
CLS1
RAS3
RDD1
VSS
VCC
ASKRX
SYNC
DOT8
DOT9
RJMTD
RJMTS
DOT5
DOT6
DOT7
VSS
DOT1
DOT2
DOT3
DOT4
TPCKI
TPRXD
TPTXD
RAS2
ROS2
ROS1
OPTCS
EXINT0
EXINT1
EXINT2
EXINT3
WRO
RDO
RA15
RA16
VSS
RA17
RA18
EXWAIT
WAIT
MCR2
IPLON
DAX2
PHAI
RCI
IRRX
VSS
VCC
UATX
UARX
UASCK
IRTX
RCO
RCVRDY2
RCVRDY1
TPRDY
TPTRDY
TPRRDY
TEST
MD0
MD1
IPLON
INT4
PRST
PTMG
TRGI
A23
LCDC
RCP2
CLS2
RDD2
RCP1
CLS1
RDD1
ASK
TPCKI
TPRXD
TPTXD
to TOUCH PANEL CON.
/TRQ1
/TRQ2
/WAIT
/EXWAIT
IPLON0
PHAI
IRDA
/UATX
/UARX
UASCK
to CPU
/TPTRDY
/TPRRDY
/IPLON0
/SHEN2
ASK/IRDA
IRTX
For I/R CN
C275
C274
C276
330pF X 3
STH2
/SCK2
HTS2
IC23 14PIN --- VCC
7PIN --- GND
IC23B
IC23A
74LS393
C152 0.1uF
IC23 VCC---GND
R91
R119
R128
R98
R101
10K X5
/OPTCS
/EXINT0
/EXINT1
/WRO
/RDO
C156
100pF
R134
10K
C114
C146
C149
C117
C127
100pF X5
R111
680
R109 1M
X2
7.3728MHz
RCRSP5019BCZZ

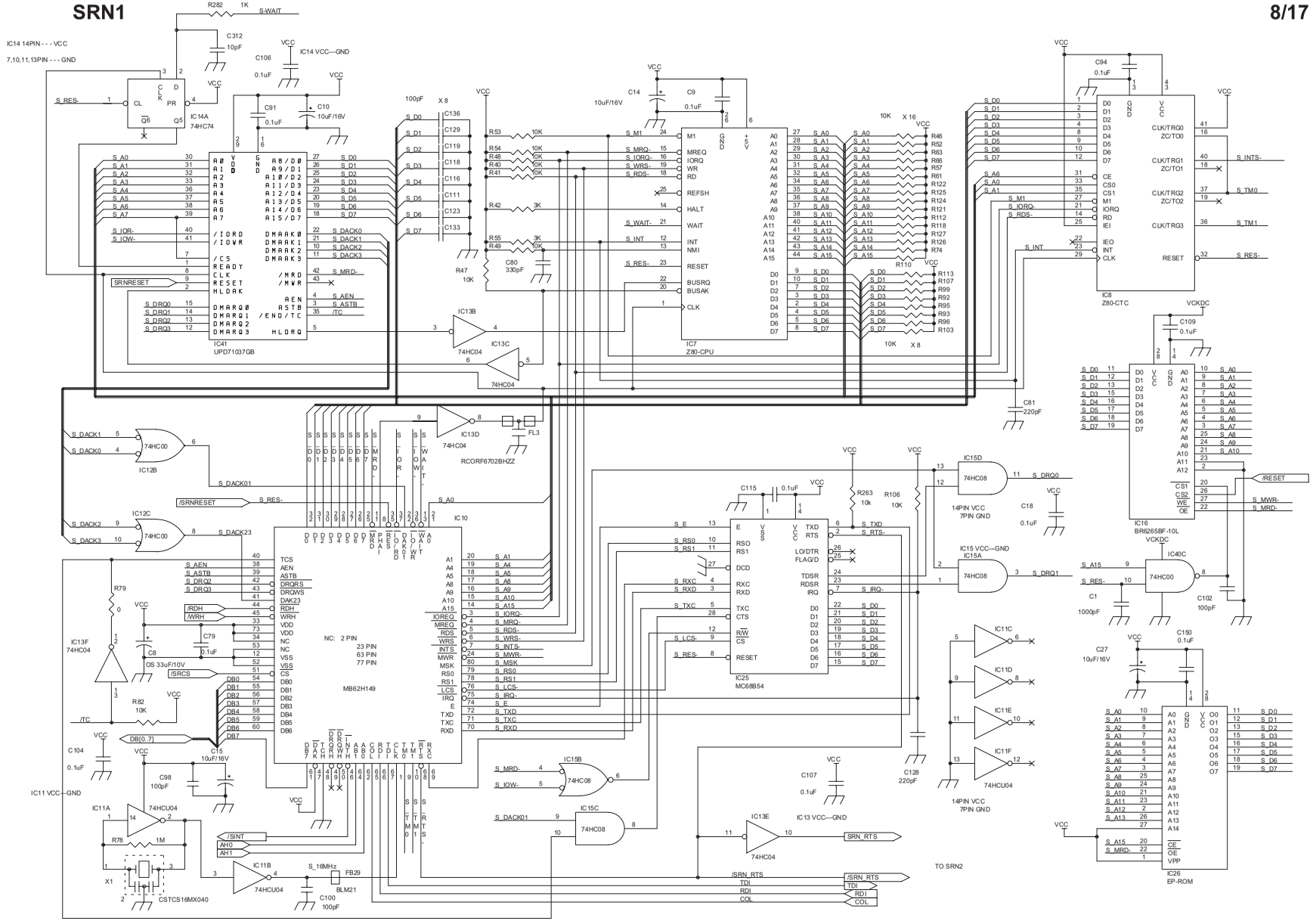
OPC2

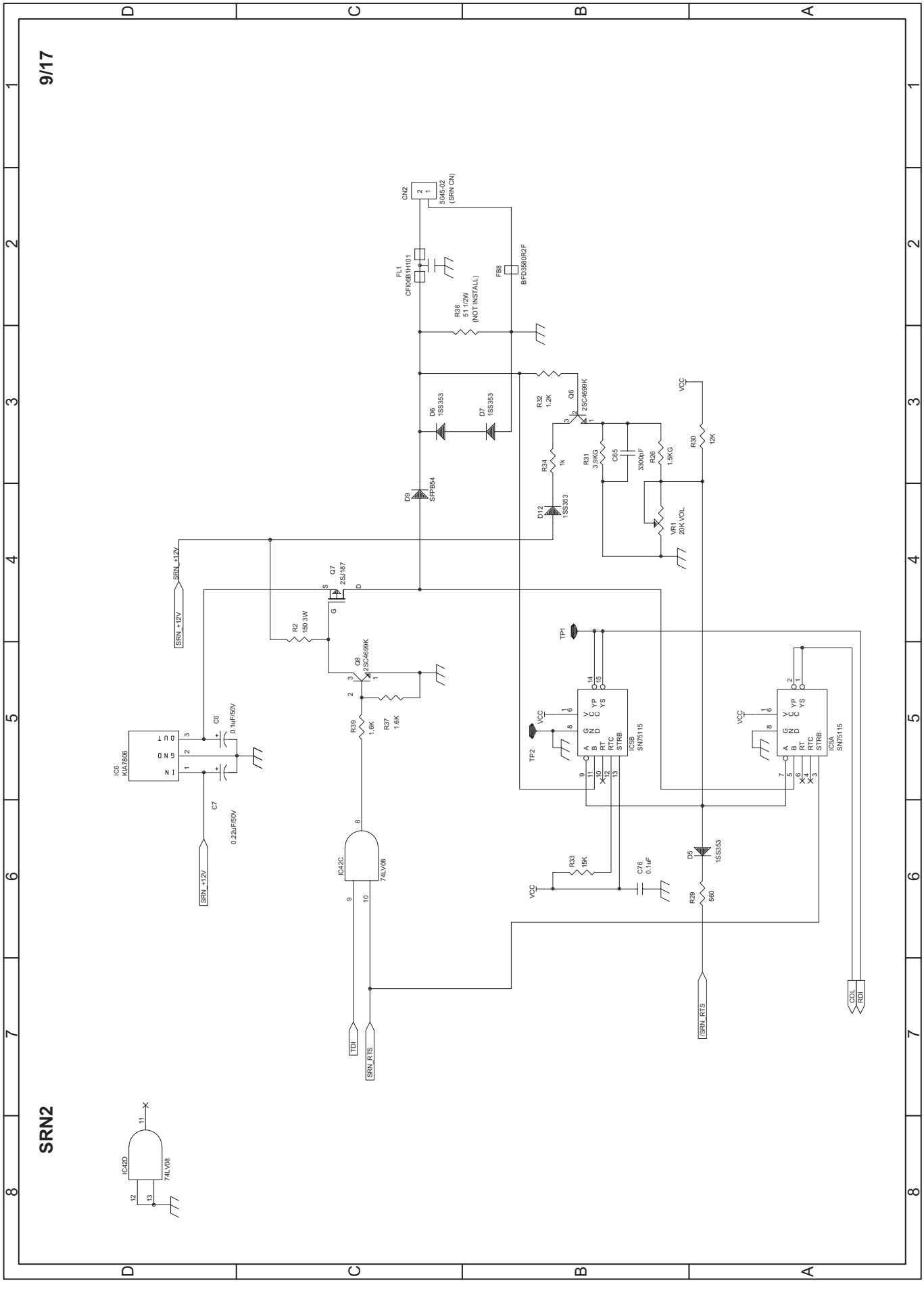
6/17

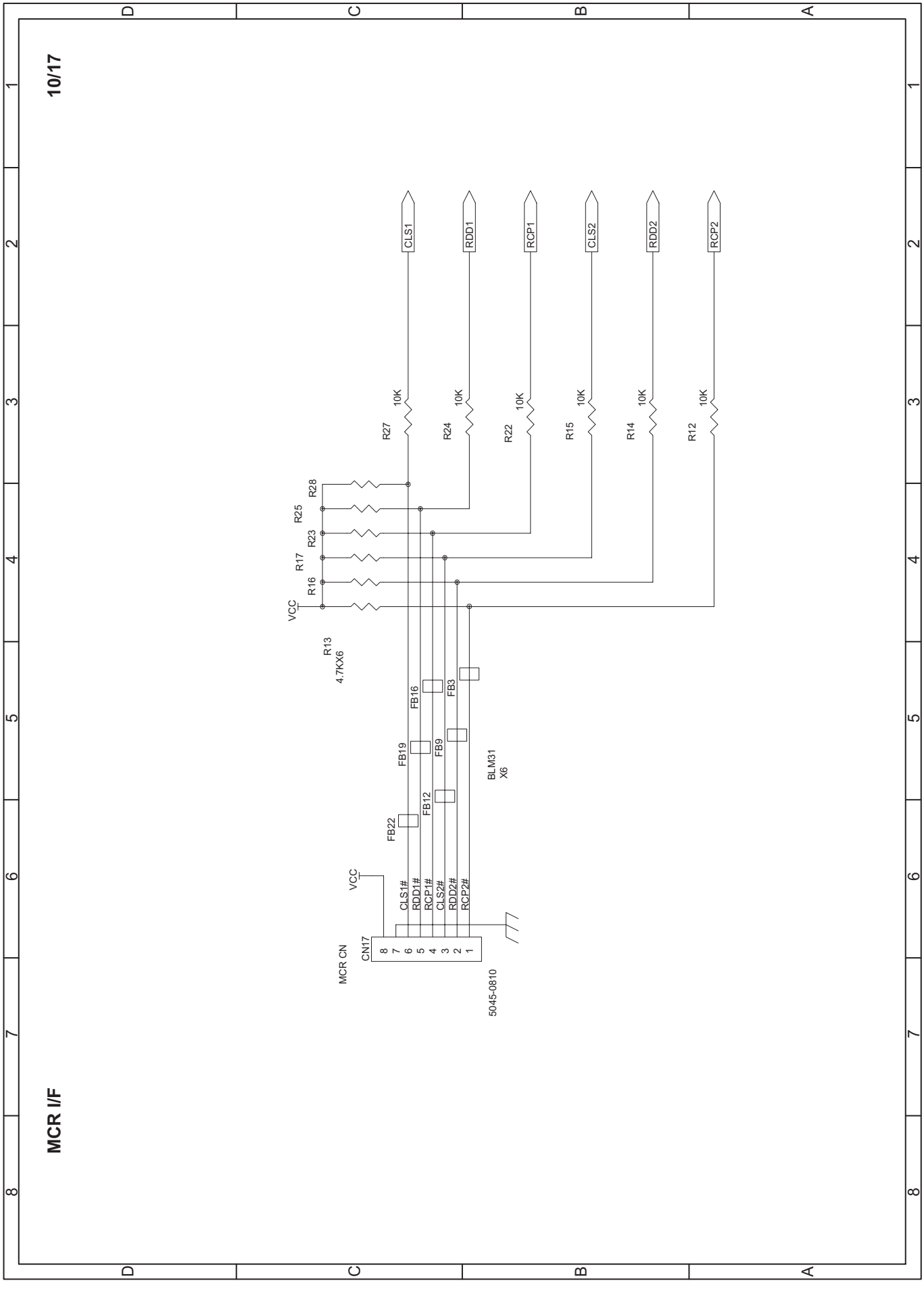

PLZ BE SHORT PATTERN!
IC9
OPC2
VCC
C11 10uF/16V
C84 0.1uF
C258 NU
R59 10K
C86 330pF
R45
R51
R60 10K X3
C87 330pF X3
C82
C90
FL2 RCORF6702BHZZ
CLK_USART
R38 10K X2
R35
C78 100pF X2
C77
R58 R56 R62 R65 R67 R68 R71 R72 R73 R76 10K X10
C85 C88 C89 C92 C93 C95 C96 C97 C99 C101 330pF X10
DB[0..7]
/WRH
/RDH
A[0..5]
/SRESET
/RES
IC42B
74LV08
IC13A
74HC04
SRNRESET
/SRNRESET
IC42 14PIN --- VCC
7PIN --- GND
IC13 14PIN --- VCC
7PIN --- GND

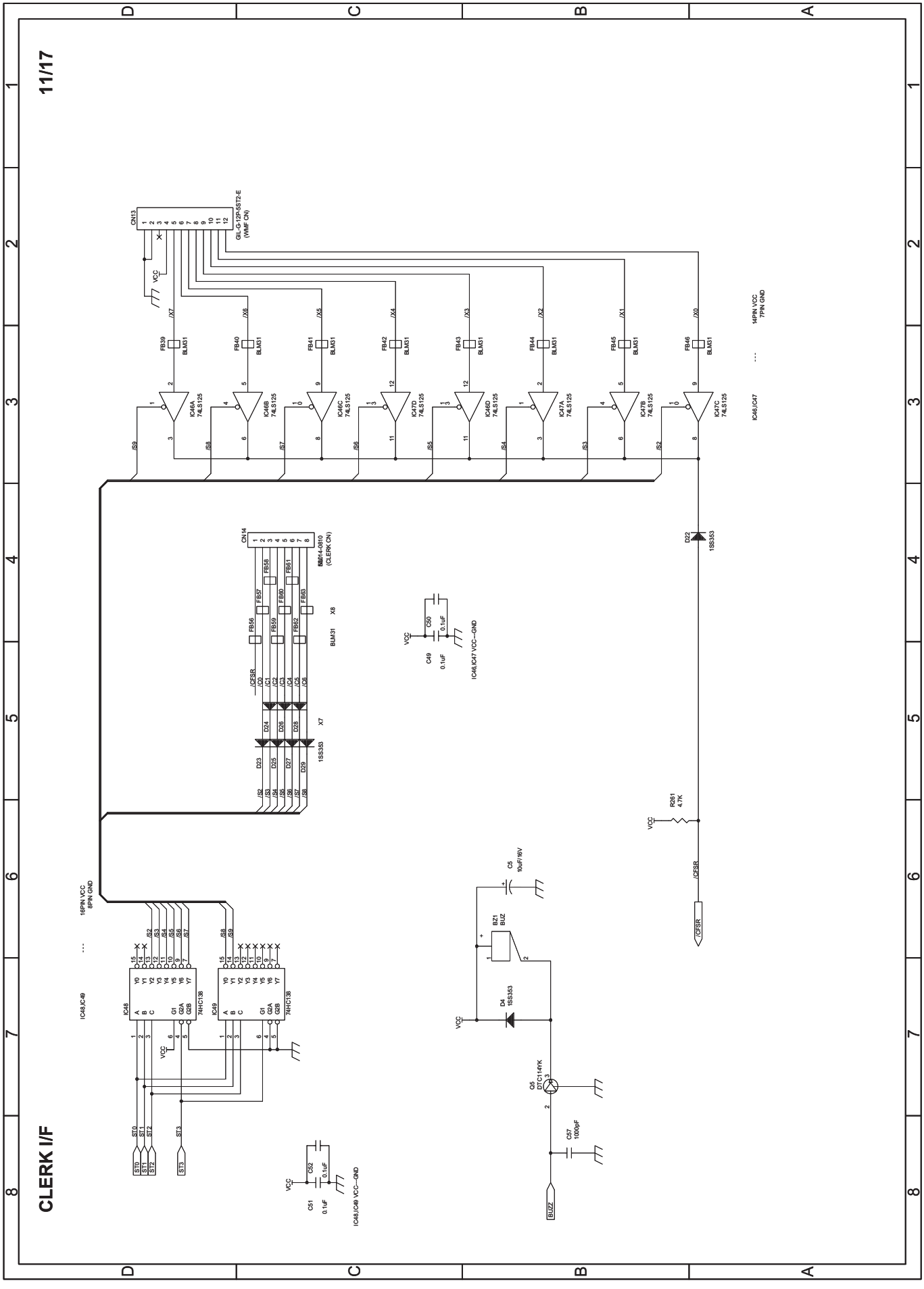

7/17
RS232
CN18
CN19
SDE9-9P
D-SUB 9PIN
IC2
MC145406
IC4C
IC4D
IC4A
IC4B
SN75189
IC44A
IC44B
IC44C
IC44D
IC44E
IC44F
74LV14A
CN20
53014-1010
to PRINTER
IC44 14PIN - - - VCC
7PIN - - - GND
IC44 VCC---GND
VCKDC
+12V
-12V
VCC
X3
10K
100pF

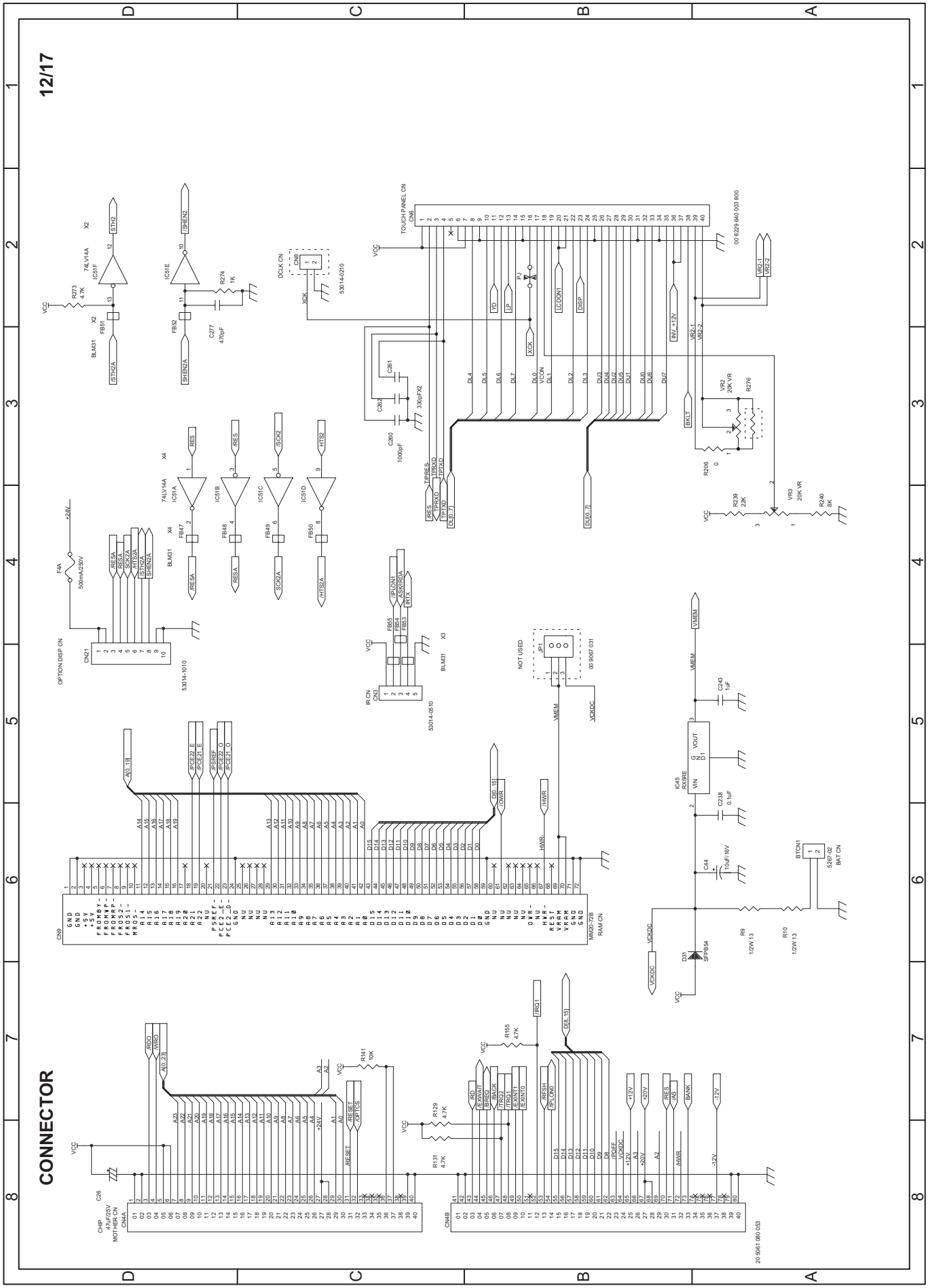
SRN1


IC14 14PIN - - - VCC
7,10,11,13PIN - - - GND
IC14A 74HC74
IC14 VCC---GND
S-WAIT
S_RES-
SRNRESET
IC41 UPD71037GB
IC7 Z80-CPU
IC8 Z80-CTC
IC10
IC12B 74HC00
IC12C 74HC00
IC13B 74HC04
IC13C 74HC04
IC13D 74HC04
IC13F 74HC04
IC11A 74HCU04
IC11B 74HCU04
IC15A 74HC08
IC15B 74HC08
IC15C 74HC08
IC15D 74HC08
IC11C 74HCU04
IC11D 74HCU04
IC11E 74HCU04
IC11F 74HCU04
IC13E 74HC04
IC25 MC68B54
IC16 BR6265BF-10L
IC40C 74HC00
IC26 EP-ROM
MB62H149
RCORF6702BHZZ
CSTCS16MX040
14PIN VCC 7PIN GND
IC13 VCC---GND
IC11 VCC---GND
TO SRN2
/SRN_RTS
SRN_RTS
/RESET


9/17
SRN2
CN2
5045-02 (SRN CN)
FL1
CFI(06B1H101
FB8
BFD3590R2F
R36
51 1/2W
(NOT INSTALL)
D6
1SS353
D7
1SS353
D9
SFPB54
R32
1.2K
Q6
2SC4699K
R34
1k
R31
3.9KG
C65
3300pF
R28
1.5KG
VR1
20K VOL.
R30
12K
VCC
D12
1SS353
SRN_+12V
Q7
2SJ187
R2
150 3W
Q8
2SC4699K
R39
1.6K
R37
1.6K
IC6
KIA7806
C6
0.1uF/50V
C7
0.22uF/50V
IC42C
74LV08
IC42D
74LV08
TP1
TP2
IC5B
SN75115
IC5A
SN75115
R33
15K
C76
0.1uF
D5
1SS53
R29
560
TDI
SRN_RTS
/SRN_RTS
COL
RDI

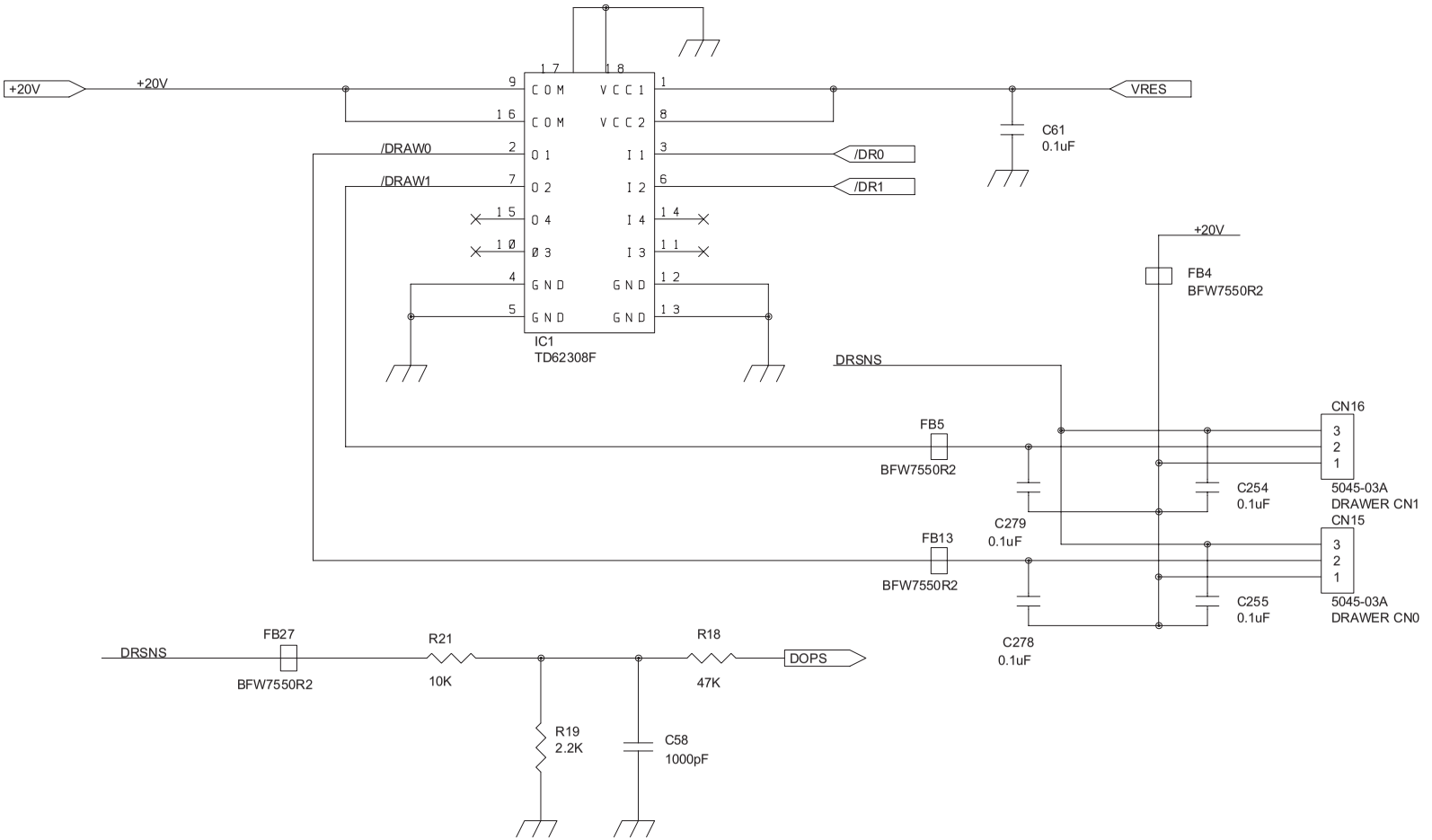

10/17
MCR I/F
CLS1
RDD1
RCP1
CLS2
RDD2
RCP2
R27 10K
R24 10K
R22 10K
R15 10K
R14 10K
R12 10K
R28
R25
R23
R17
R16
VCC
R13
4.7KX6
FB16
FB3
FB19
FB9
FB12
FB22
BLM31
X6
VCC
CLS1#
RDD1#
RCP1#
CLS2#
RDD2#
RCP2#
CN17
MCR CN
8
7
6
5
4
3
2
1
5045-0810


11/17
CLERK I/F
CN13
GIL-G-12P-SST2-E
(WMF CN)
VCC
/X7
/X6
/X5
/X4
/X3
/X2
/X1
/X0
FB39
FB40
FB41
FB42
FB43
FB44
FB45
FB46
BLM31
IC46A
74LS125
IC46B
74LS125
IC46C
74LS125
IC47D
74LS125
IC46D
74LS125
IC47A
74LS125
IC47B
74LS125
IC47C
74LS125
IC46,IC47
14PIN VCC
7PIN GND
/S9
/S8
/S7
/S6
/S5
/S4
/S3
/S2
CN14
BM14-08N0
(CLERK CN)
FB56
FB57
FB58
FB59
FB60
FB61
FB62
FB63
X8
/CFSR
/C0
/C1
/C2
/C3
/C4
/C5
/C6
D24
D26
D28
X7
D23
D25
D27
D29
1SS353
/S2
/S3
/S4
/S5
/S6
/S7
/S8
C50
0.1uF
C49
0.1uF
IC46,IC47 VCC--GND
D22
1SS353
R261
4.7K
/CFSR
16PIN VCC
8PIN GND
IC48,IC49
IC48
IC49
74HC138
A
B
C
G1
G2A
G2B
Y0
Y1
Y2
Y3
Y4
Y5
Y6
Y7
/S2
/S3
/S4
/S5
/S6
/S7
/S8
/S9
ST0
ST1
ST2
ST3
C52
0.1uF
C51
0.1uF
IC48,IC49 VCC--GND
C5
10uF/16V
BZ1
BUZ
D4
1SS353
Q5
DTC114YK
C57
1000pF
BUZZ


CONNECTOR
12/17
CHIP 47uF/25V MOTHER CN CNMA
CNMB
20.5061.080.053
RAM CN MM20-72B
OPTION DISP CN CN21 53014-1010
IR CN CN3 53014-0610
DCLK CN CN8 53014-0210
TOUCH PANEL CN CN6
00 6229 640 003 800
BAT CN BTCN1 5267-02
NOT USED JP1 00 9067 031
VCC
+24V
+12V
-20V
VMEM
VCKDC
RES
HS
BANK
HWR
RFSH
IRQ1
IRD
/EXWAIT
/BREQ
/BACK
/TRDY1
/EXINT1
/EXINT0
/RESET
/OPTCS
/PDIF
/IPLCD0
/IPLCD1
/IPLON1
/ASKIREQA
/RTX
/TPRES
/TPRXD
/TPTXD
/RES
/SCK2A
/HTS2A
/SHEN2A
/STH2A
/SCK2
/HTS2
/SHEN2
/STH2
/RESA
/SCK2A
/HTS2A
/SHEN2A
/STH2A
/SCK2A
/HTS2A
/SHEN2A
/STH2A
/RES
/SCK2
/HTS2
/SHEN2
/STH2
/RESA
/SCK2A
/HTS2A
/SHEN2A
/STH2A
/RESA
/SCK2A
/HTS2A
/SHEN2A
/STH2A
/RES
/SCK2
/HTS2
/SHEN2
/STH2

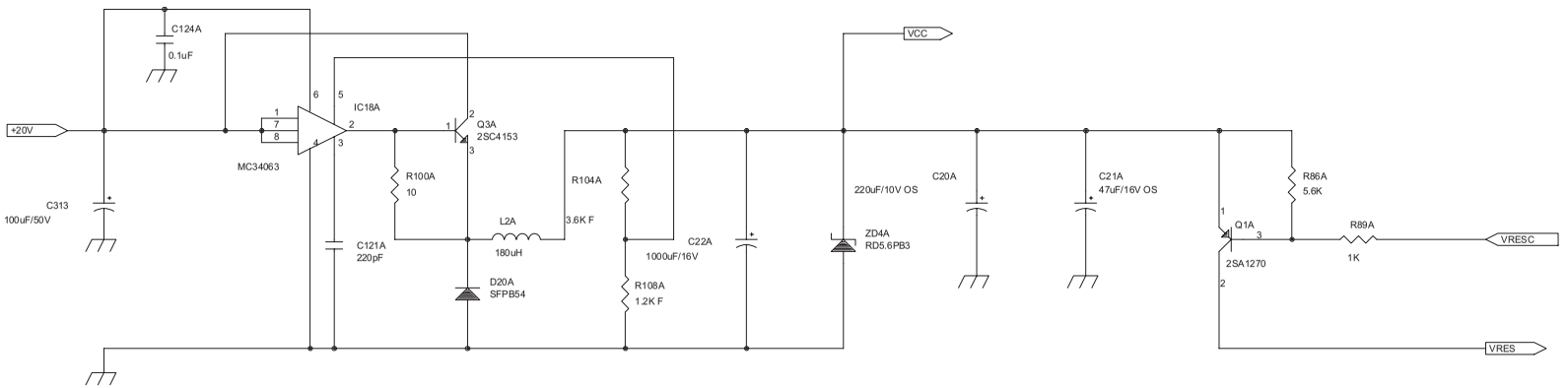
DRAWER

13/17

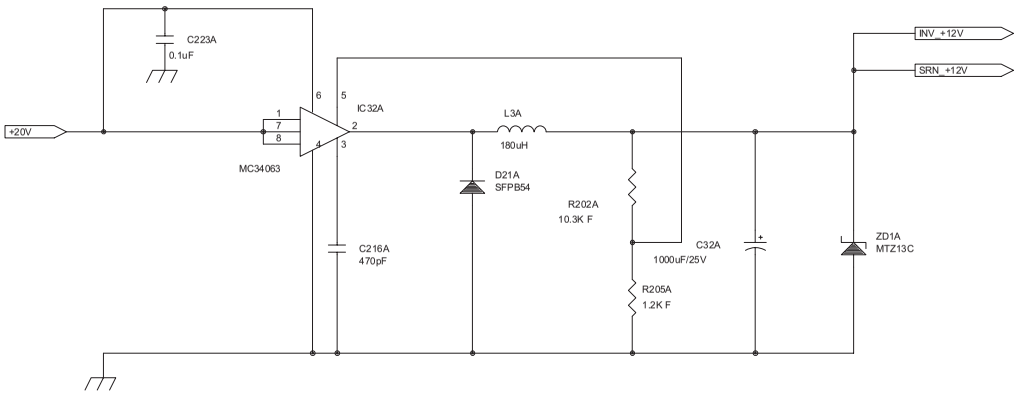

+20V
+20V
17
18
9
COM
VCC1
1
16
COM
VCC2
8
VRES
C61
0.1uF
/DRAW0
2
O1
I1
3
/DR0
/DRAW1
7
O2
I2
6
/DR1
15
O4
I4
14
10
O3
I3
11
4
GND
GND
12
5
GND
GND
13
IC1
TD62308F
+20V
FB4
BFW7550R2
DRSNS
CN16
3
2
1
FB5
BFW7550R2
C254
0.1uF
5045-03A
DRAWER CN1
C279
0.1uF
CN15
FB13
BFW7550R2
3
2
1
C255
0.1uF
5045-03A
DRAWER CN0
C278
0.1uF
DRSNS
FB27
BFW7550R2
R21
10K
R18
47K
DOPS
R19
2.2K
C58
1000pF

VCC/INV_12V CIRCUIT

[VCC POWER CIRCUIT]

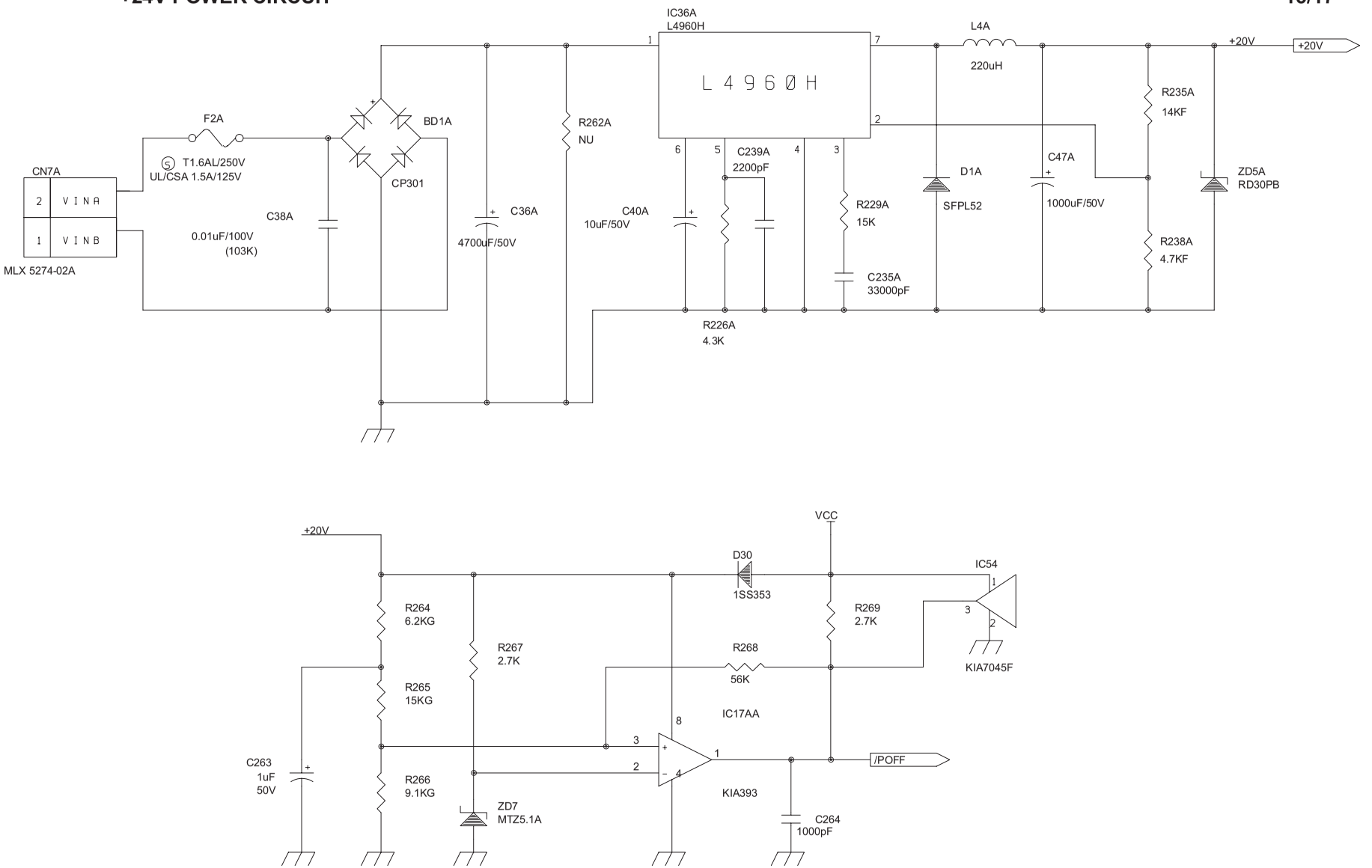


[INV_+12V POWER CIRCUIT]



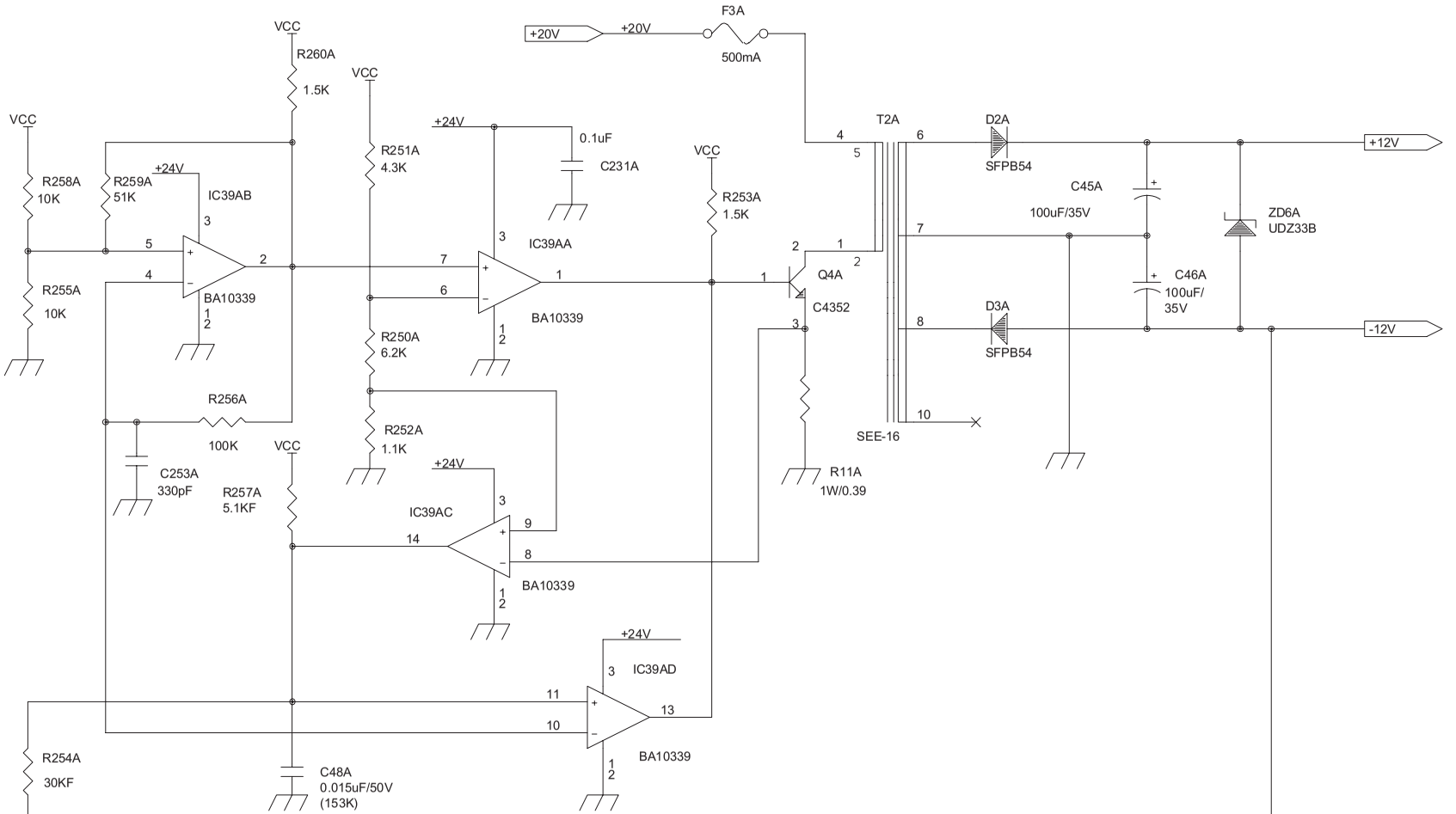
+24V POWER CIRCUIT

15/17



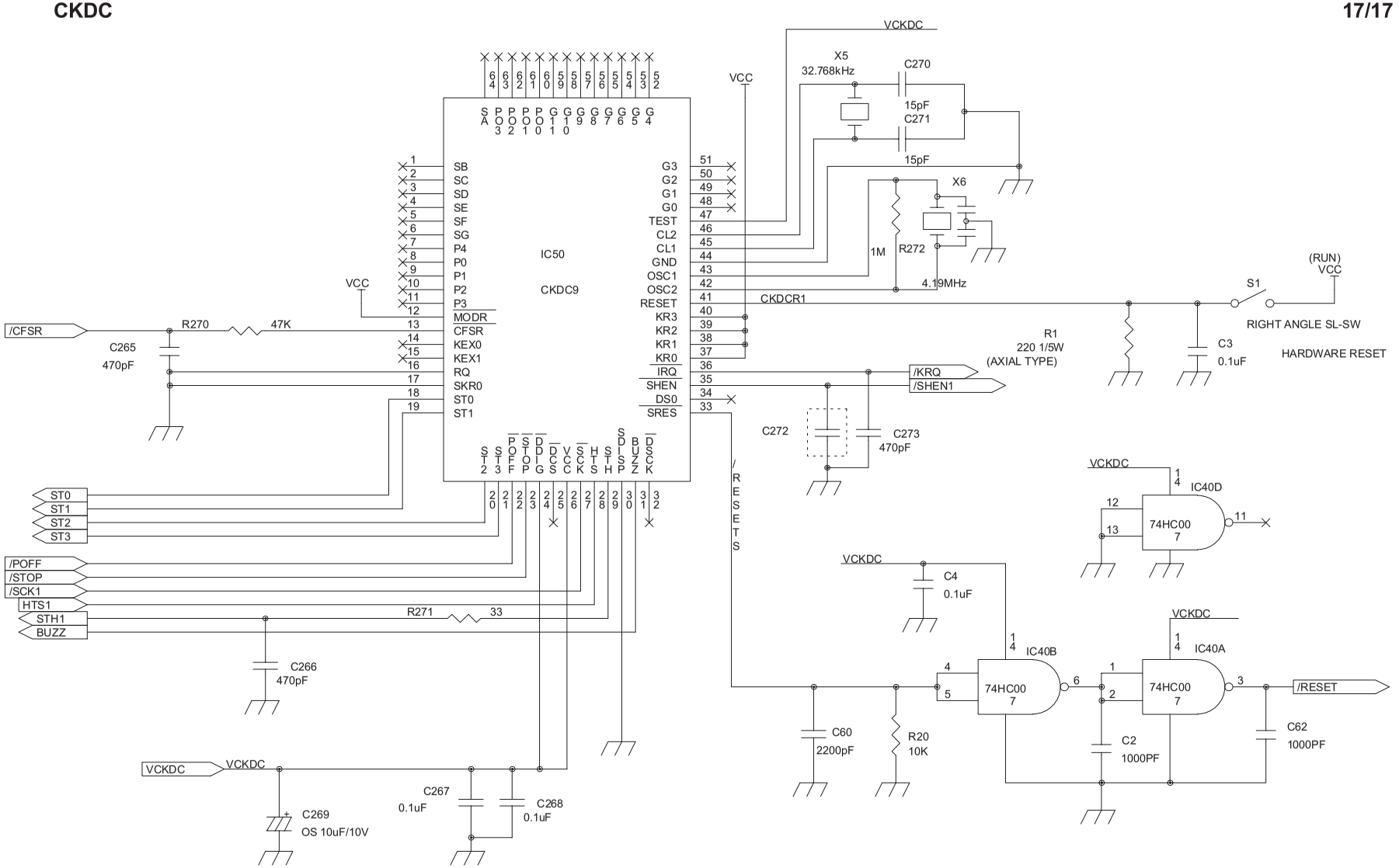
+12V/-12V POWER CIRCUIT

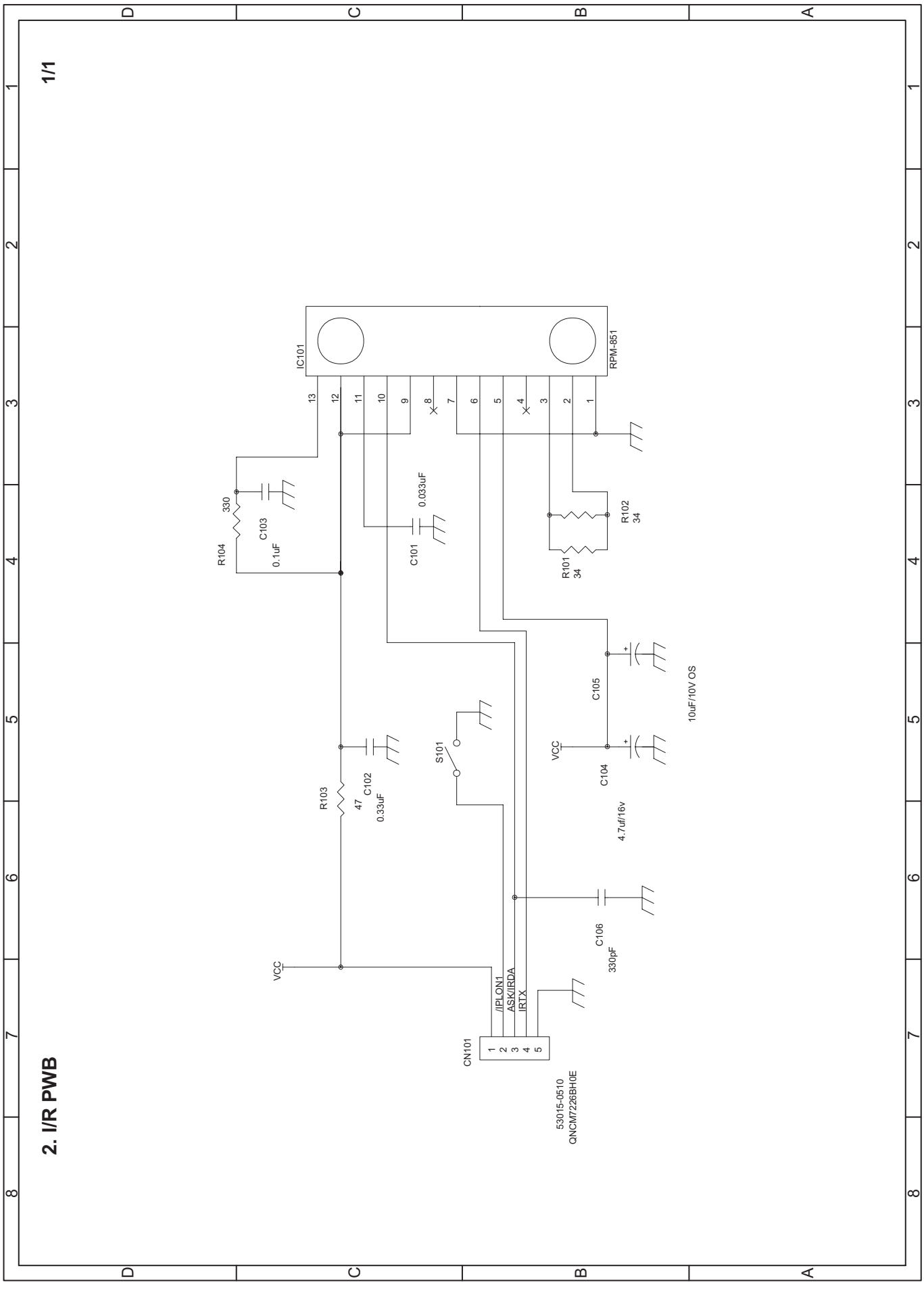
16/17

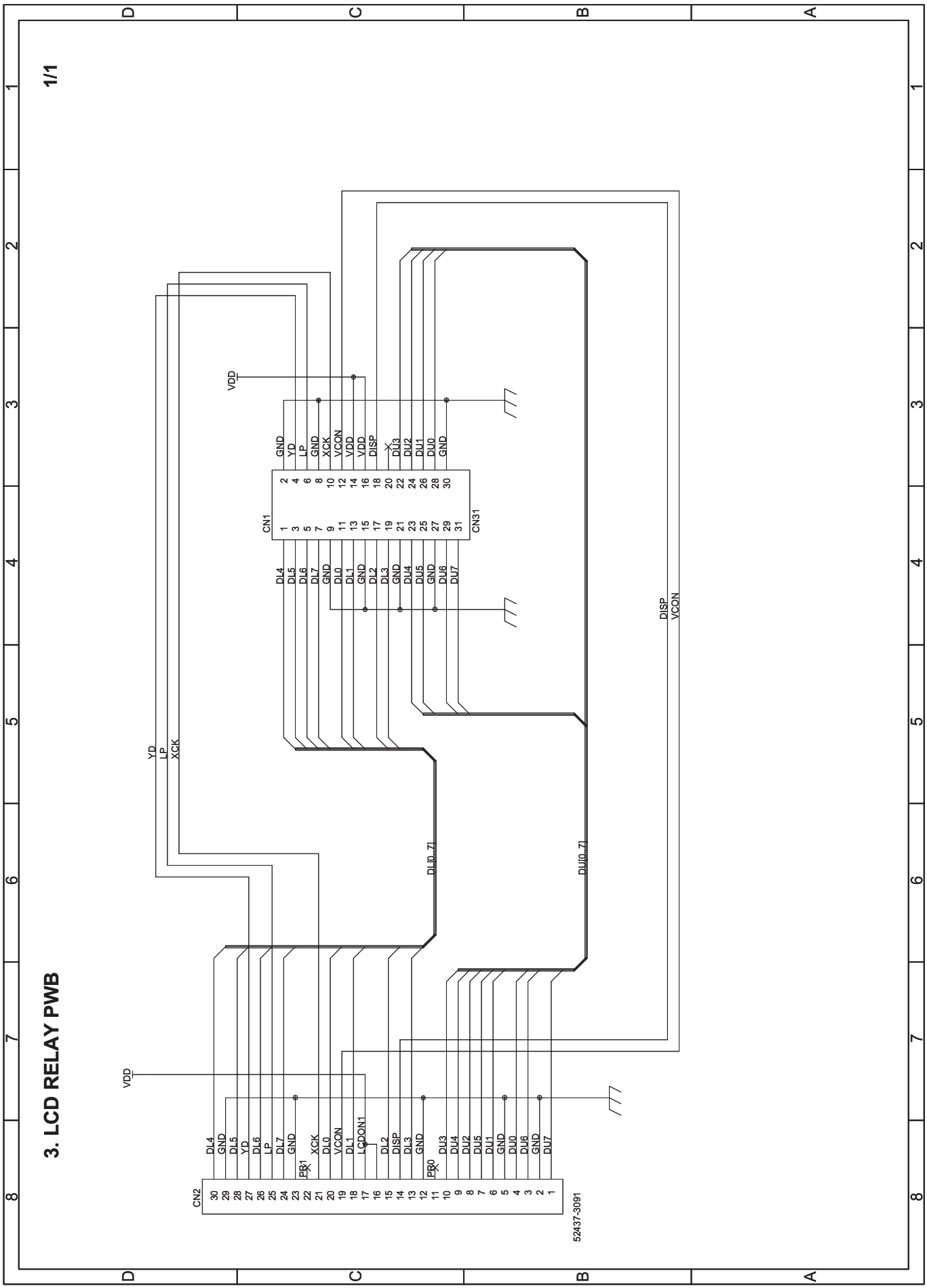


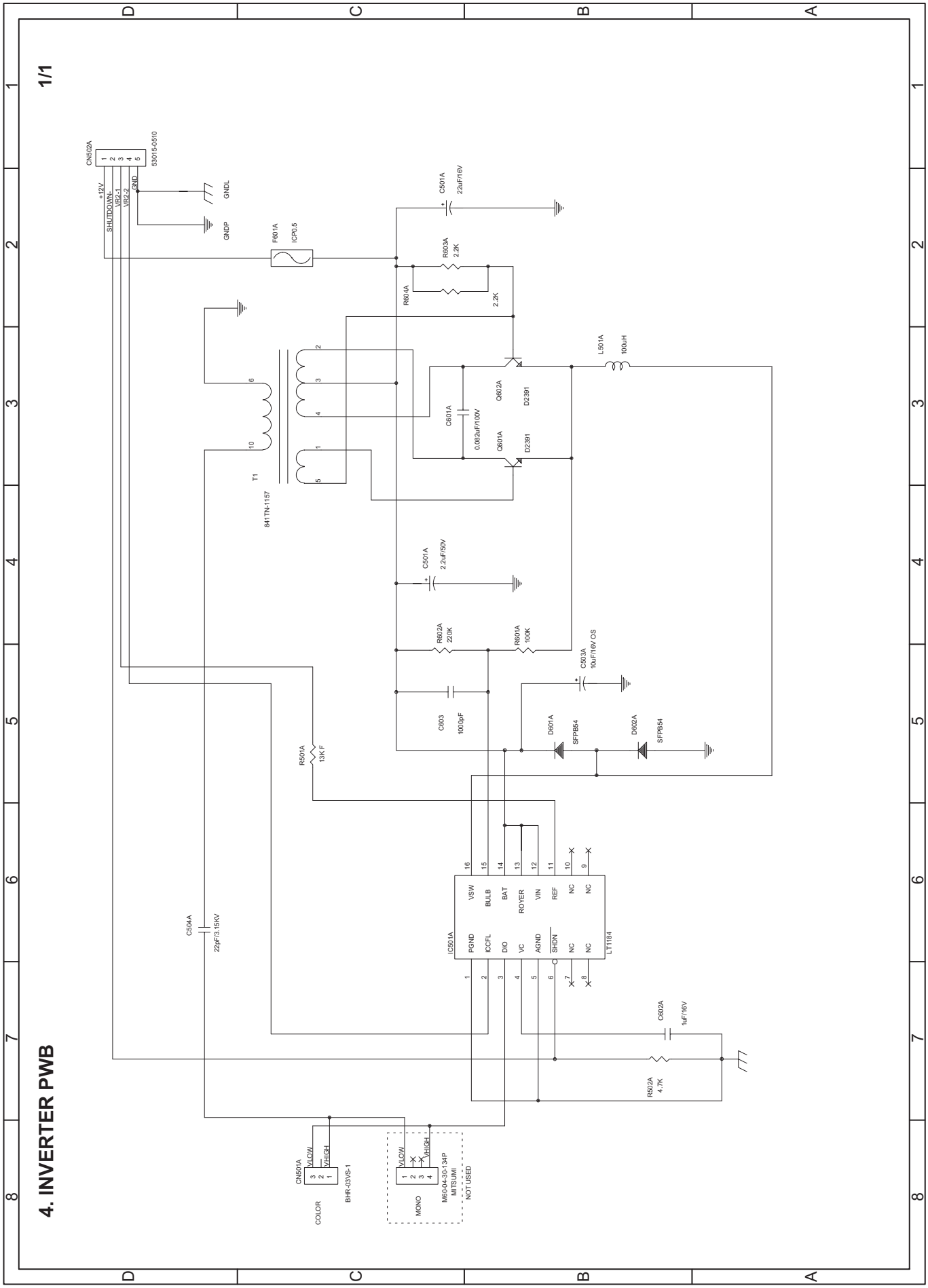
CKDC

17/17

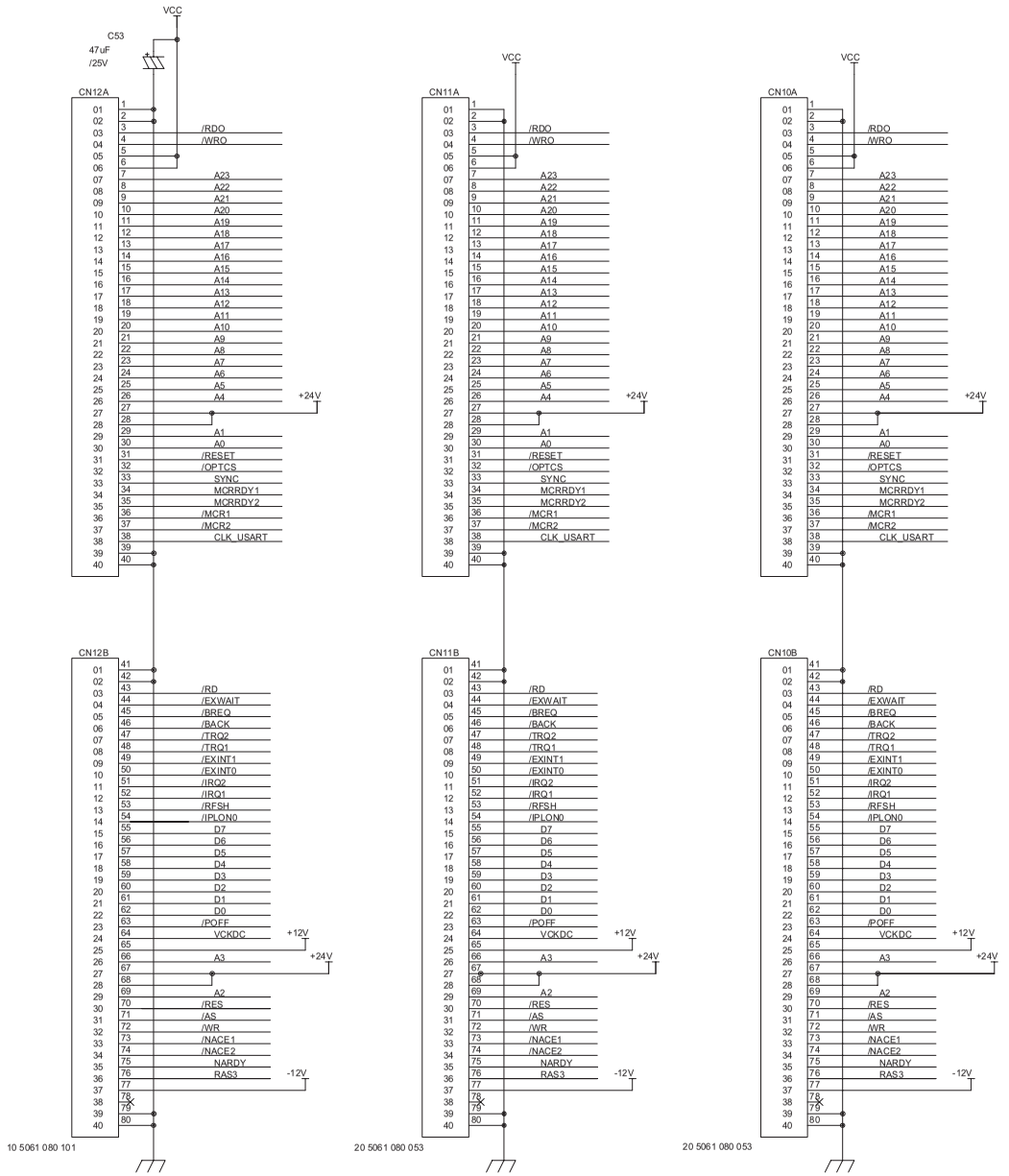

VCKDC
X5
32.768kHz
C270
15pF
C271
15pF
X6
1M
R272
4.19MHz
VCC
IC50
CKDC9
SB
SC
SD
SE
SF
SG
P4
P0
P1
P2
P3
MODR
CFSR
KEX0
KEX1
RQ
SKR0
ST0
ST1
G3
G2
G1
G0
TEST
CL2
CL1
GND
OSC1
OSC2
RESET
KR3
KR2
KR1
KR0
IRQ
SHEN
DS0
SRES
CKDCR1
(RUN)
VCC
S1
RIGHT ANGLE SL-SW
HARDWARE RESET
R1
220 1/5W
(AXIAL TYPE)
C3
0.1uF
/CFSR
R270
47K
C265
470pF
/KRQ
/SHEN1
C272
C273
470pF
/RESET
ST0
ST1
ST2
ST3
/POFF
/STOP
/SCK1
HTS1
STH1
BUZZ
R271
33
C266
470pF
VCKDC
C4
0.1uF
IC40D
74HC00
IC40B
IC40A
C60
2200pF
R20
10K
C2
1000PF
C62
1000PF
VCKDC
C269
OS 10uF/10V
C267
0.1uF
C268
0.1uF


1/1
2. I/R PWB
IC101
RPM-851
13
12
11
10
9
8
7
6
5
4
3
2
1
R104
330
C103
0.1uF
C101
0.033uF
R101
34
R102
34
R103
47
C102
0.33uF
S101
C105
C104
4.7uf/16v
10uF/10V OS
VCC
C106
330pF
CN101
1
2
3
4
5
//PLON1
ASK/IRDA
IRTX
53015-0510
QNCM7226BH0E

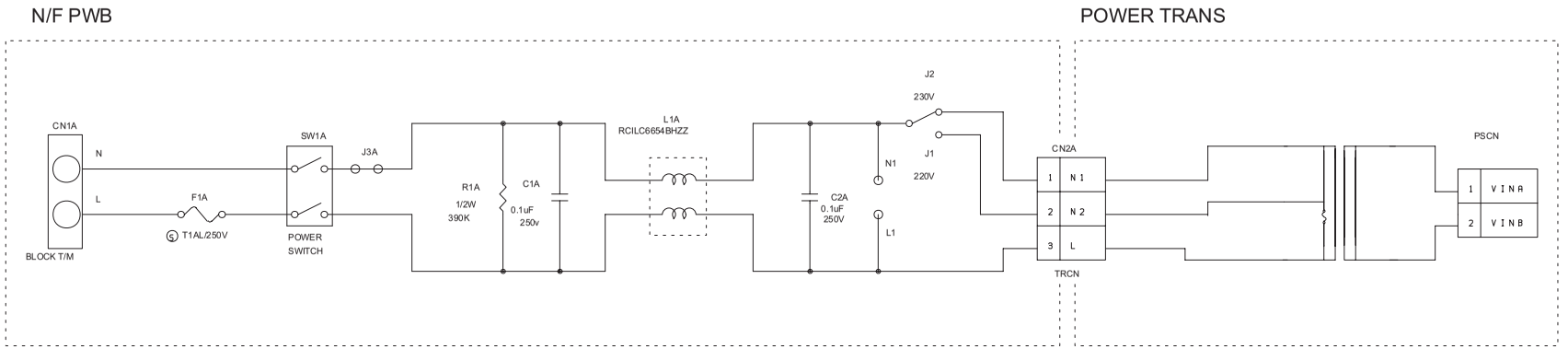

3. LCD RELAY PWB
1/1
CN2
CN1
CN31
VDD
YD
LP
XCK
DISP
VCON
DL0-7]
DU0-7]
LCDON1
52437-3091


4. INVERTER PWB
1/1
CN502A
53015-0510
+12V
SHUTDOWN
VR2-1
VR2-2
GND
GNDL
GNDP
F601A
ICP0.5
C501A
22uF/16V
R603A
2.2K
R604A
2.2K
L501A
100uH
T1
841TN-1157
C601A
0.082uF/100V
Q602A
D2391
Q601A
D2391
C501A
2.2uF/50V
R602A
220K
R601A
100K
C503A
10uF/16V OS
C603
1000pF
D601A
SFPB54
D602A
SFPB54
R501A
13K F
C504A
22pF/3.15KV
IC501A
LT1184
VSW
BULB
BAT
ROYER
VIN
REF
NC
NC
PGND
ICCFL
DIO
VC
AGND
SHDN
NC
NC
C602A
1uF/16V
R502A
4.7K
CN501A
VLOW
VHIGH
BHR-03VS-1
COLOR
M60-04-30-134P
MITSUMI
NOT USED
MONO

5. MOTHER PWB

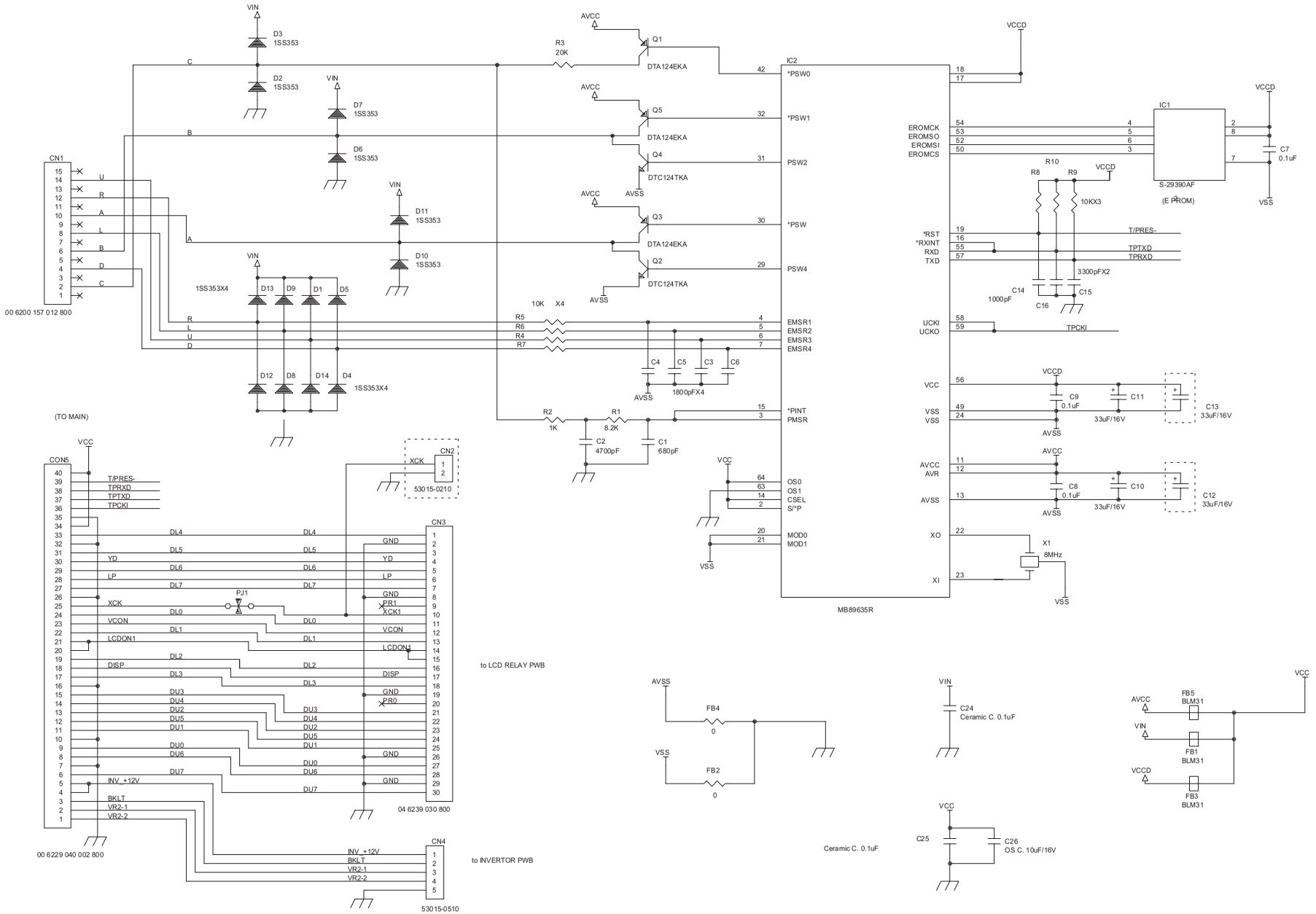

VCC
C53
47uF
/25V
CN12A
CN12B
CN11A
CN11B
CN10A
CN10B
/RDO
/WRO
A23
A22
A21
A20
A19
A18
A17
A16
A15
A14
A13
A12
A11
A10
A9
A8
A7
A6
A5
A4
+24V
A1
A0
/RESET
/OPTCS
SYNC
MCRRDY1
MCRRDY2
/MCR1
/MCR2
CLK_USART
/RD
/EXWAIT
/BREQ
/BACK
/TRQ2
/TRQ1
/EXINT1
/EXINT0
/IRQ2
/IRQ1
/RFSH
/IPLON0
D7
D6
D5
D4
D3
D2
D1
D0
/POFF
VCKDC
+12V
A3
+24V
A2
/RES
/AS
/WR
/NACE1
/NACE2
NARDY
RAS3
-12V
10 5061 080 101
20 5061 080 053
20 5061 080 053

6. N/F PWB UNIT


N/F PWB
POWER TRANS
CN1A
N
L
BLOCK T/M
F1A
T1AL/250V
SW1A
POWER
SWITCH
J3A
R1A
1/2W
390K
C1A
0.1uF
250v
L1A
RCILC6654BHZZ
C2A
0.1uF
250V
N1
L1
J2
230V
J1
220V
CN2A
1 N 1
2 N 2
3 L
TRCN
PSCN
1 V I N A
2 V I N B

7. TOUCH PANEL PWB

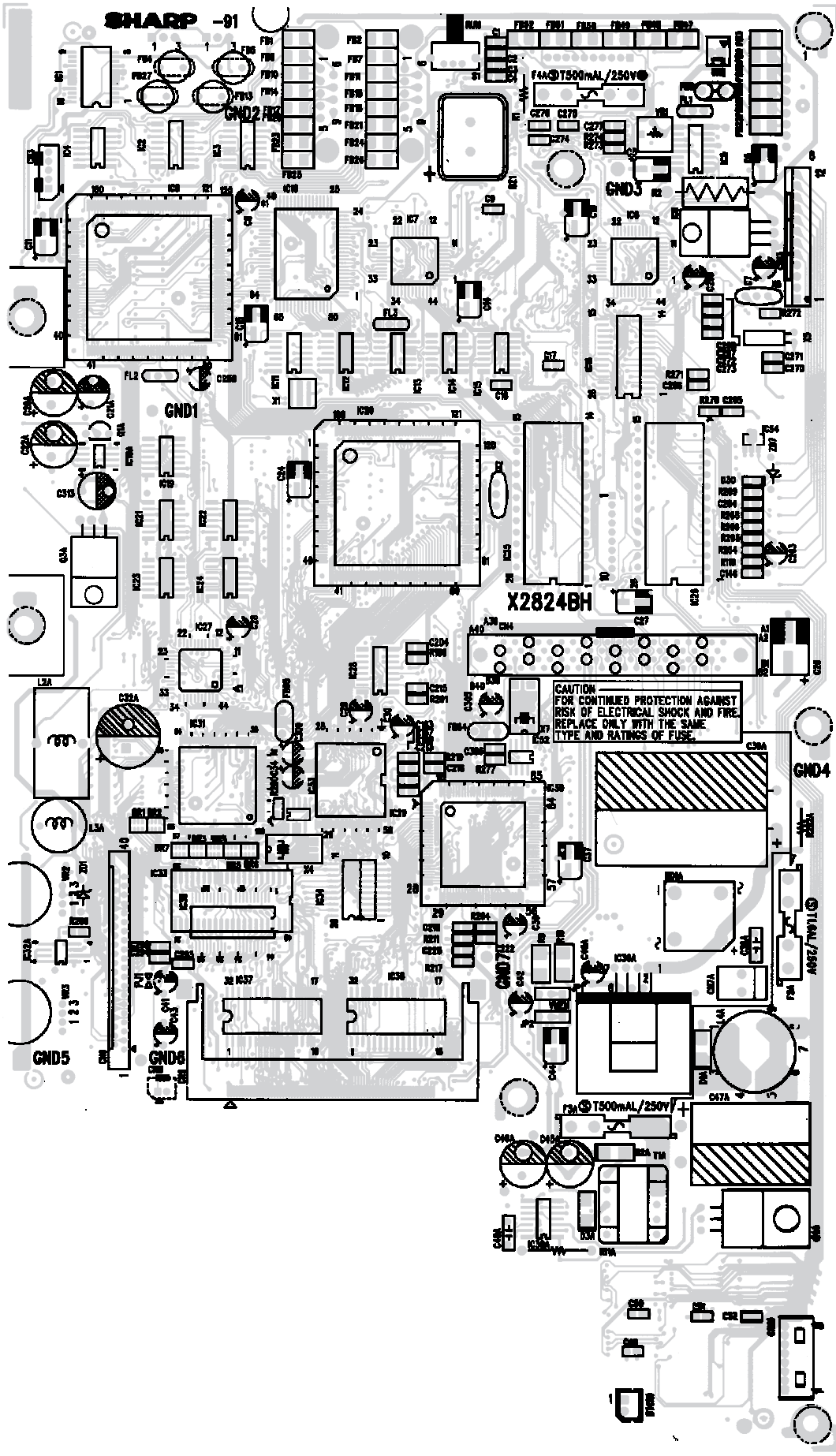
1/1

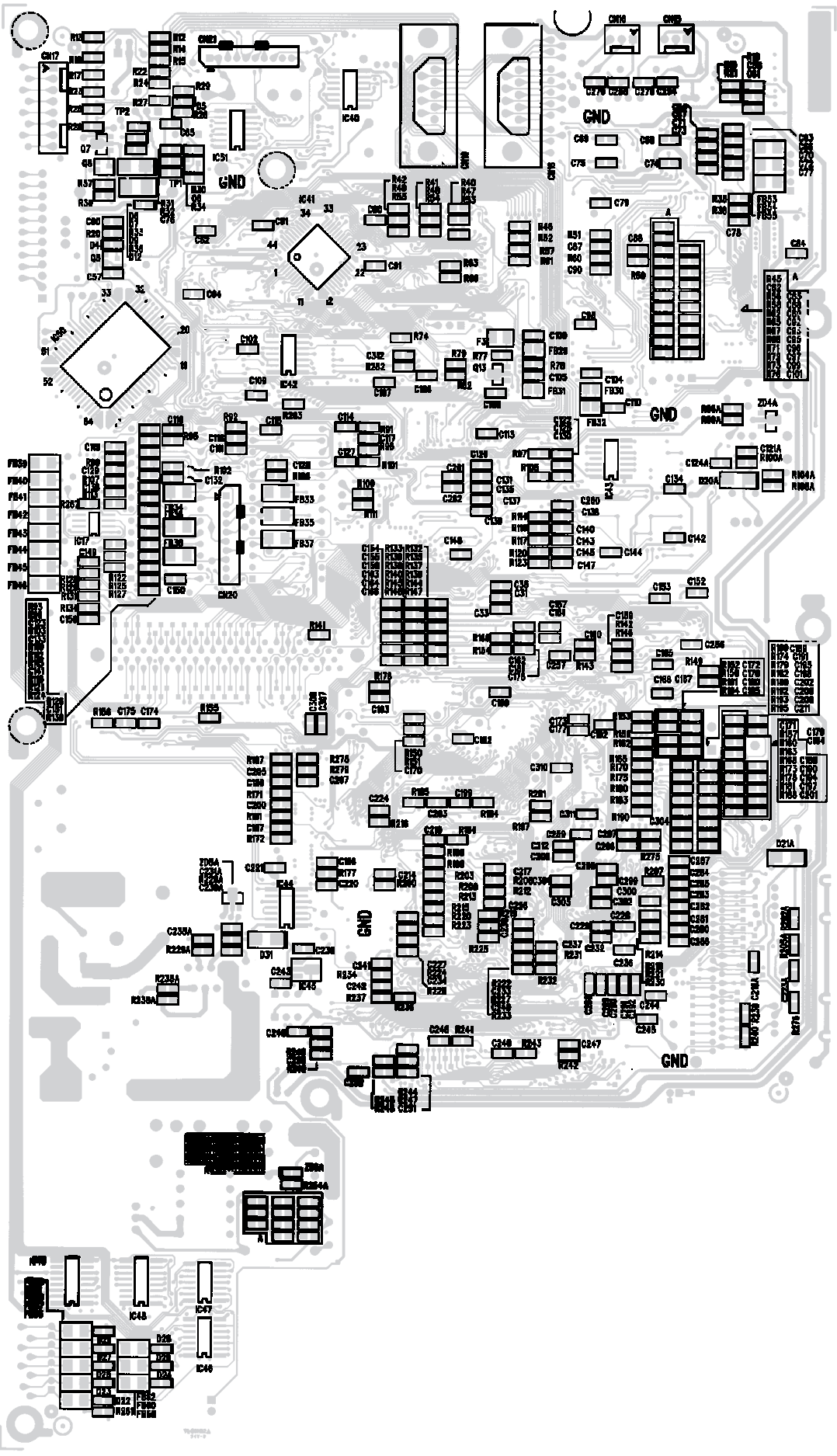


CHAPTER 9. PWB LAYOUT

1. Main PWB

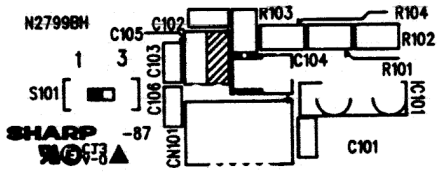
[A sade]





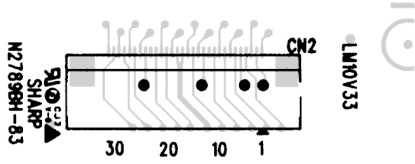
[B sade]

2. IR PWB

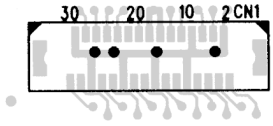


3. LCD PWB

[A Side]

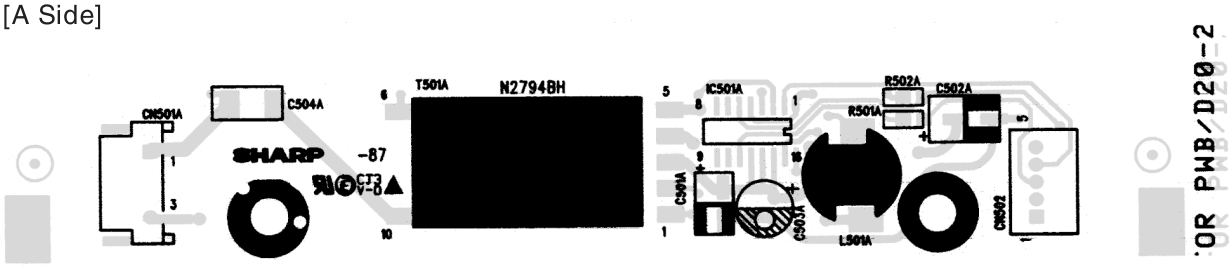


[B Side]

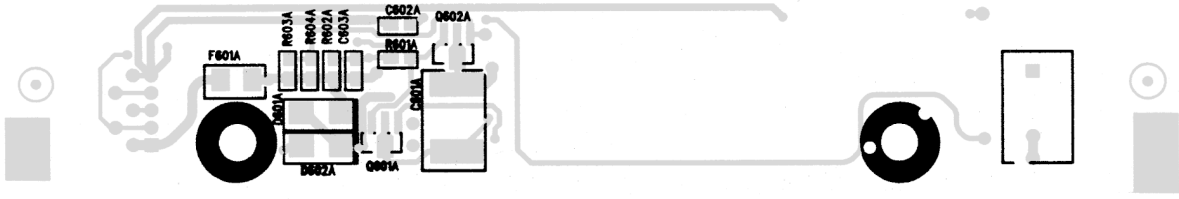


4. INVERTER PWB

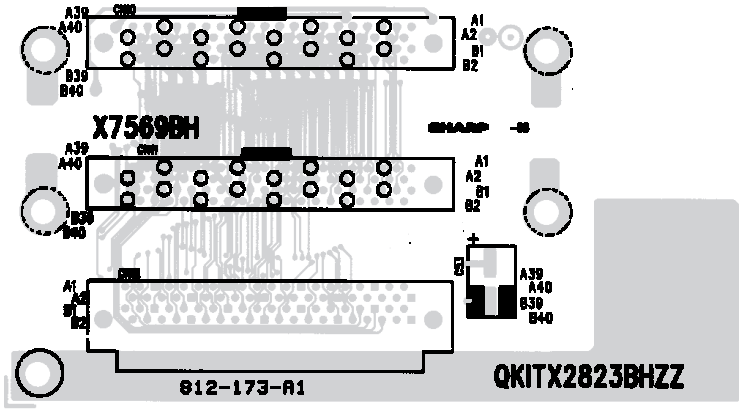
[A Side]



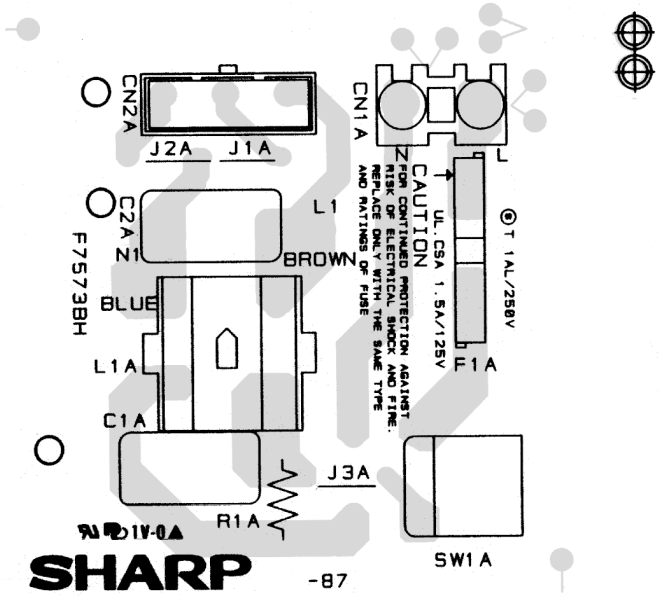
[B Side]



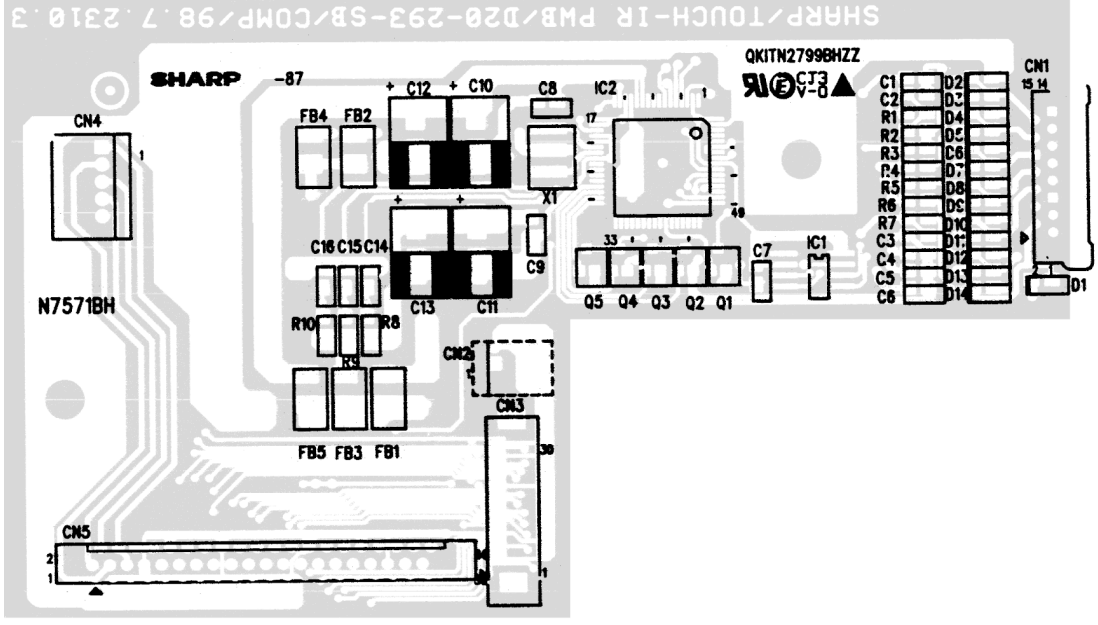
5. MOTHER PWB



6. N/F PWB



7. TOUCH PANEL PWB



SHARP PARTS GUIDE

MODEL UP-3300

(for KA,KB,TQ,TS)

CONTENTS

1 Top cabinet etc.
2 Bottom cabinet etc.
3 Packing material & Accessories
4 Main PWB unit
5 Mother PWB unit
6 Touch panel PWB unit
7 N/F PWB unit
8 Invertor PWB unit
9 IR PWB unit
10 LCD PWB unit
11 Service route options & Service tools
■ Index

Because parts marked with "⚠" is indispensable for the machine safety maintenance and poeration, it must be replaced with the parts specific to the product specification.

Table of destinations

SELECTION CODE	COUNTRIES
U	U.S.A., Guam
A	Canada
TS	Germany
TQ	SEEG territory other than Germany (Stamp:English)
TR	SEEG territory other than Germany (Stamp:English)
KB	U.Kingdom
KA	Australia

SELECTION CODE	COUNTRIES
K	Korea

SELECTION CODE	COUNTRIES
SB	Saudi Arabia (127V area)
SBA	Saudi Arabia (220V area)
SC	Taiwan
SD	Venezuela
SE	Hong Kong
SG	Lebanon, Syria, Greece, Pakistan, Iran, Egypt, Thailand, Iraq, Mauritius, Seychelles, Tahiti, Jordan, Sudan, Turkey
SH	South Africa (U.S.A. version)
SHE	South Africa (Europe version)
SJ	Philippines (Europe version)
SJ2	Philippines (U.S.A. version)
SM	Kuwait, Qatar, Oman, UAE, Malta, Bahrain
SMT	Nigeria, Yemen, Kenya

SELECTION CODE	COUNTRIES
RA1	Morocco, Algeria, Tunisia, West Africa
RA2	Chile, Uruguay, Peru, Argentina, Paraguay
RA5	Sri Lanka

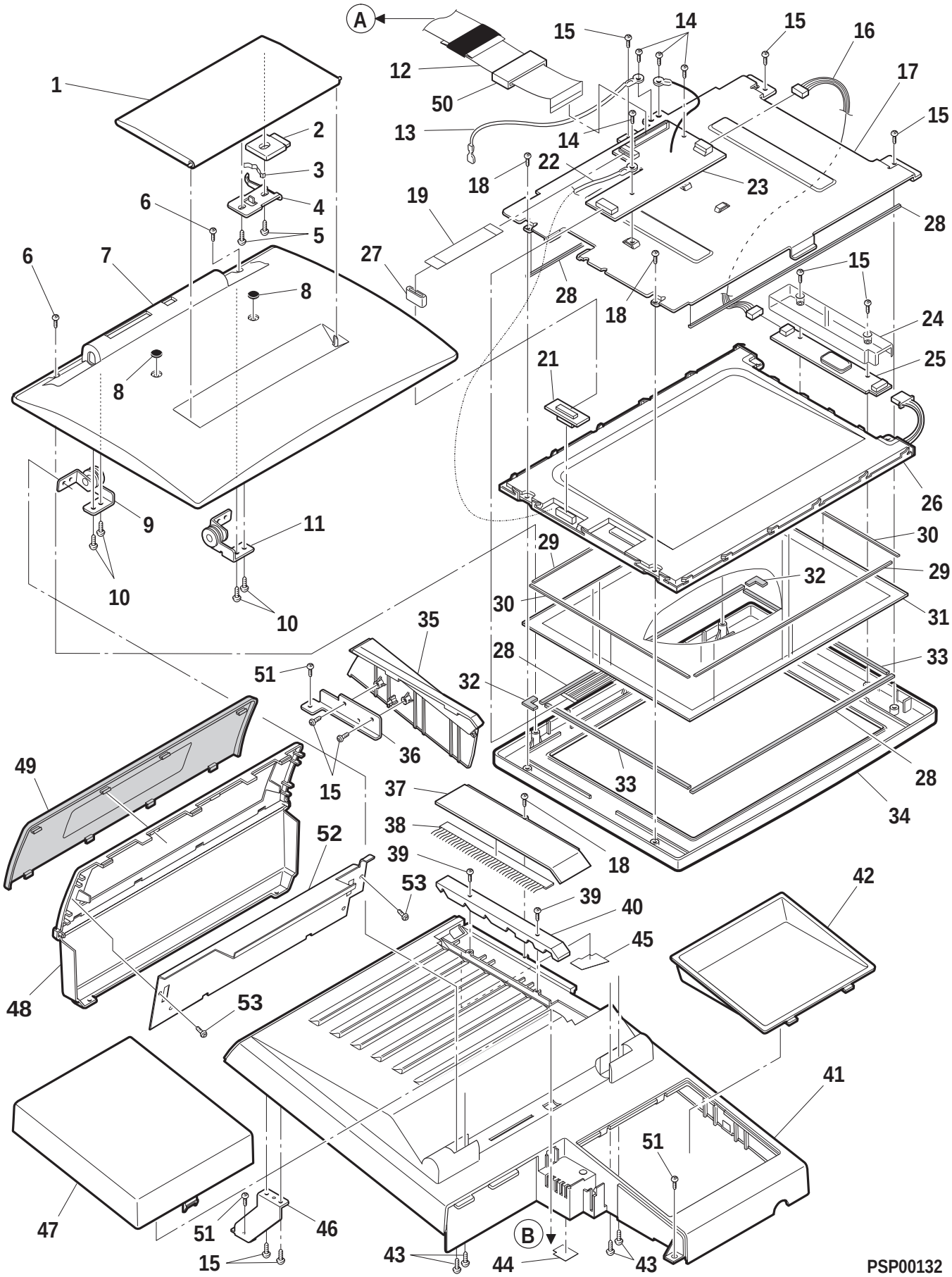
SELECTION CODE	COUNTRIES
RB3	Indonesia
RB4	
RB5	Cyprus
RB6	Panama
RB7	Barbados
RB8	Malaysia (U.S.A. version)

SELECTION CODE	COUNTRIES
RC1	Malaysia (Europe version)
RC2	Singapore
RC5	Dominican Republic, Ecuador

1 Top cabinet etc.

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	GSTN-2005BHZZ	AT		D	Tilt stand
2	JKNBZ2411BHZZ	AH		C	Tilt knob
3	MSPRP2372BHZZ	AE		C	Tilt spring
4	MLEVF2324BHZZ	AG		C	Tilt lever
5	LX-BZ6787BHZZ	AB		C	Screw (3×5)
6	XJSSD30P10000	AA		C	Screw (3×10)
7	GCABF7873BHZZ	BA		D	LCD rear cabinet
8	PGUMM2389BHZZ	AE		C	LCD cushion
9	MHNG-2324BHZZ	AX		C	Hinge L
10	XUBSD40P08000	AA		C	Screw (4×8)
11	MHNG-2325BHZZ	AX		C	Hinge R
12	QCNW-2972BHZA	AR	N	C	Flat cable (40P 280mm)
13	QCNW-2995BHZZ	AF		C	GND wire (LCD angle-Main Chassis)
14	XHBSD30P05000	AA		C	Screw (3×5)
15	XEBSD30P08000	AA		C	Screw (M3×8)
16	QCNW-2976BHZZ	AK		C	Inverter cable
17	LANGK7649BHZZ	AV		C	LCD plate
18	XEPSD30P08000	AA		C	Screw (3×8)
19	QCNW-2973BHZZ	AS		C	Flat cable (30P 0.5mm PITCH)
21	CPWBN2789BH01	BA		E	LCD PWB unit
22	QCNW-2996BHZZ	AD		C	LCD GND wire
23	CPWBN7571BH01	BR		E	Touch panel PWB unit
24	GCŌVH7167BHZZ	AH		D	Invertor cover
25	CPWBN2794BH01	BQ		E	Inverter PWB unit
26	VVLLM10V33/-1	CS		E	LCD (LM10V33)
27	RCŌRF6709RCZZ	AL		C	Core
28	PGUMM6731BHZZ	AR		C	T/P gum B
29	PGUMM6733BHZZ	AR		C	LCD gum B
30	PGUMM6732BHZZ	AS		C	LCD gum A
31	HPNLC6839RCZZ	BT		D	Touch panel
32	PGUMM6734BHZZ	AL		C	T/P gum C
33	PGUMM6730BHZZ	AS		C	T/P gum A
34	GCABE7872BHZZ	AX		D	LCD front cabinet
35	GCŌVA7159BHZZ	AS		D	Side cover
36	LANGK7651BHZZ	AL		C	Cab angle 2
37	GCŌVA7166BHZZ	AP		D	Tilt cover
38	PSHEG2859BHZZ	AV		C	Dust sheet
39	XJSSD30P08000	AA		C	Screw (3×8)
40	JKNBZ6923BHZZ	AP		C	Tilt lock
41	GCABB7870BHZZ	BB		D	Top cabinet
42	GFTAT6927BHZZ	AR		D	Keyboard lid
43	XBBSD30P08000	AA		C	Screw (M3×8)
44	PSHEP2472BHZZ	AH		C	W sheet 2
45	PSHEP2471BHZZ	AH		C	W sheet 1
46	LANGK7650BHZZ	AH		C	Cab angle 1
47	GFTAT6928BHZZ	AV		D	Printer lid
48	GCŌVA7158BHZZ	AW		D	Rear cover
49	PFiLW6979BHZZ	AV		D	Rear filter
50	RCŌRF2031SCZZ	AN		C	Core (SSC-50-12-F)
51	XUPSD40P12000	AA		C	Screw (M4×12)(M)
52	LANGT2847BHZZ	AP	N	C	Rear cover angle
53	XEBSD30P06000	AA		C	Screw (M3×6)

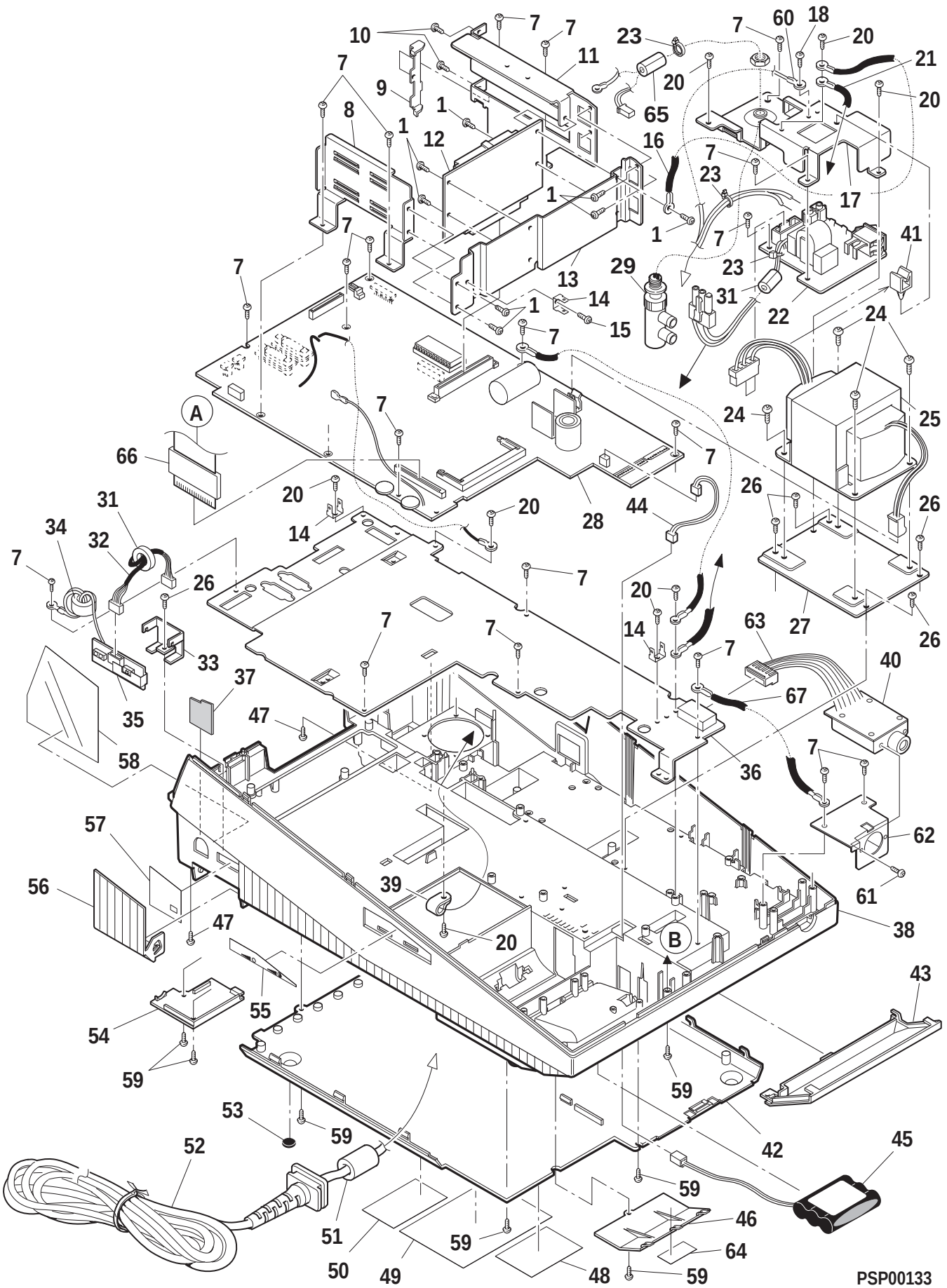
1 Top cabinet etc.



2 Bottom cabinet etc.

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	LX-BZ6782BHZZ	AA		C	Screw (3×8KS)
7	XEBSD30P08000	AA		C	Screw (M3×8)
8	LANGT7638BHZZ	AM		C	Option angle 2
9	LANGT2808BHZZ	AK		C	Option angle 4
10	LX-BZ6778BHZZ	AA		C	Screw (3×6)
11	LANGT7637BHZZ	AT		C	Option angle 1
12	CPWBX7569BH01	CA		E	Mother PWB unit
13	LANGT7640BHZZ	AR		C	Mother board angle
14	QTANZ6661BHZZ	AE		C	Faston terminal
15	XHBSD30P04000	AA		C	Screw (3×4)
16	QCNW-2992BHZZ	AF		C	GND wire (Mother angle-NF angke)
17	LANGT7641BHZA	AQ	N	C	AC SW angle
18	XBPBZ40P06K00	AA		C	Screw (M4×6K)
20	XHBSD30P06000	AA		C	Screw (3×6)
21	QCNW-2993BHZZ	AG		C	GND wire (Main chassis-NF angle)
22	CPWBF7573BH02	BH	N	E	N/F PWB unit [KA,KB]
	CPWBF7573BH03	BH	N	E	N/F PWB unit [TQ,TS]
23	LBNDJ2003SCZZ	AA		C	Cable band
24	XBPSD40P08KS0	AA		C	Screw (M4×8KS)
⚠ 25	RTRNP2403BHZZ	BL	N	B	Power transformer
26	XEBSD30P06000	AA		C	Screw (M3×6)
27	LANGK2805BHZZ	AQ		C	Trans angle
28	CPWBX2824BH01	CZ	N	E	Main PWB unit
29	QCNW-3030BHZZ	BG	N	C	BNC cable (F-TYPE)
31	RCŌRF6697BHZZ	AF		C	Core (TC18A15)
32	QCNW-2975BHZZ	AY		C	IR sield cable
33	LANGK2807BHZZ	AQ		C	IR angle
34	RCŌRF6698BHZZ	AR		C	Core (SC18B)
35	CPWBN2799BH01	BN		E	IR PWB unit
36	LCHSM6709BHZZ	AX		C	Main chassis
37	PFiLW2423BHZZ	AP		D	IR sheet
38	GCABA7871BHZZ	BF		D	Bottom cabinet
39	LHLDW0006SCZZ	AB		C	Wire holder (NK-3N)
40	LKGiW7375BHZA	BH		B	Clerk switch (body)
41	LHLDW2365BHZZ	AG		C	Wire saddle
42	GCŌVH2472BHZZ	BA		D	Bottom cover
43	GFTAU2426BHZZ	AR		D	FDD lid
44	QCNW-7708BHZZ	AM		C	Battery cable
45	UBATN2338RCZZ	BE		B	Battery (3HR-AAC)
46	GCŌVH7160BHZZ	AN		D	Battery cover
47	XEBSF30P10000	AA		C	Screw (3×10)
48	TLABG6967BHZZ	AC		D	Battery label
49	TLABG7097BHZZ	AF		D	Battery caution label
50	TCAUS6677BHZZ	AD		D	Caution label
51	RCŌRF6695BHZZ	AK		C	Core (CP14A)
⚠ 52	QACCV6422BHZZ	AY		B	AC cord [KA]
⚠	QCNW-7212RCZZ	AH		B	AC cord [KB]
⚠	QPLGA0006QCZZ	AQ		C	Plug (3A 250V) [KB]
⚠	QACCV6422BHZZ	AY		B	AC cord [TQ,TS]
53	GLEGG6659BHZZ	AE		D	T/gum leg
54	LHLDK6847BHZZ	AN		C	AC cord cover
55	TLABH2460BHZZ	AE		D	Volume label
56	GCŌVH7161BHZZ	AN		D	AT cover
57	PSHEP2861BHZZ	AH		C	IPL sheet
58	PSHEP2862BHZZ	AH		C	SEP sheet
59	XEBSD30P10000	AA		C	Screw (3×10)
60	QTANP0004BHZA	AE		C	Earth terminal (GP20076-U) [KA,KB]
61	XJSSD26P08000	AA		C	Screw (2.6×8)
62	LANGK7657BHZZ	AK	N	C	Clerk angle
63	QCNW-3024BHZZ	AL	N	C	Clerk cable
64	TLABH6996BHZZ	AD		D	Battery cover seal [KB]
65	RCŌRF6700BHZZ	AS		C	Core (BNF-14)
66	RCŌRF2031SCZZ	AN		C	Core (SSC-50-12-F)
67	QCNW-7895BHZZ	AF	N	S	GND wire

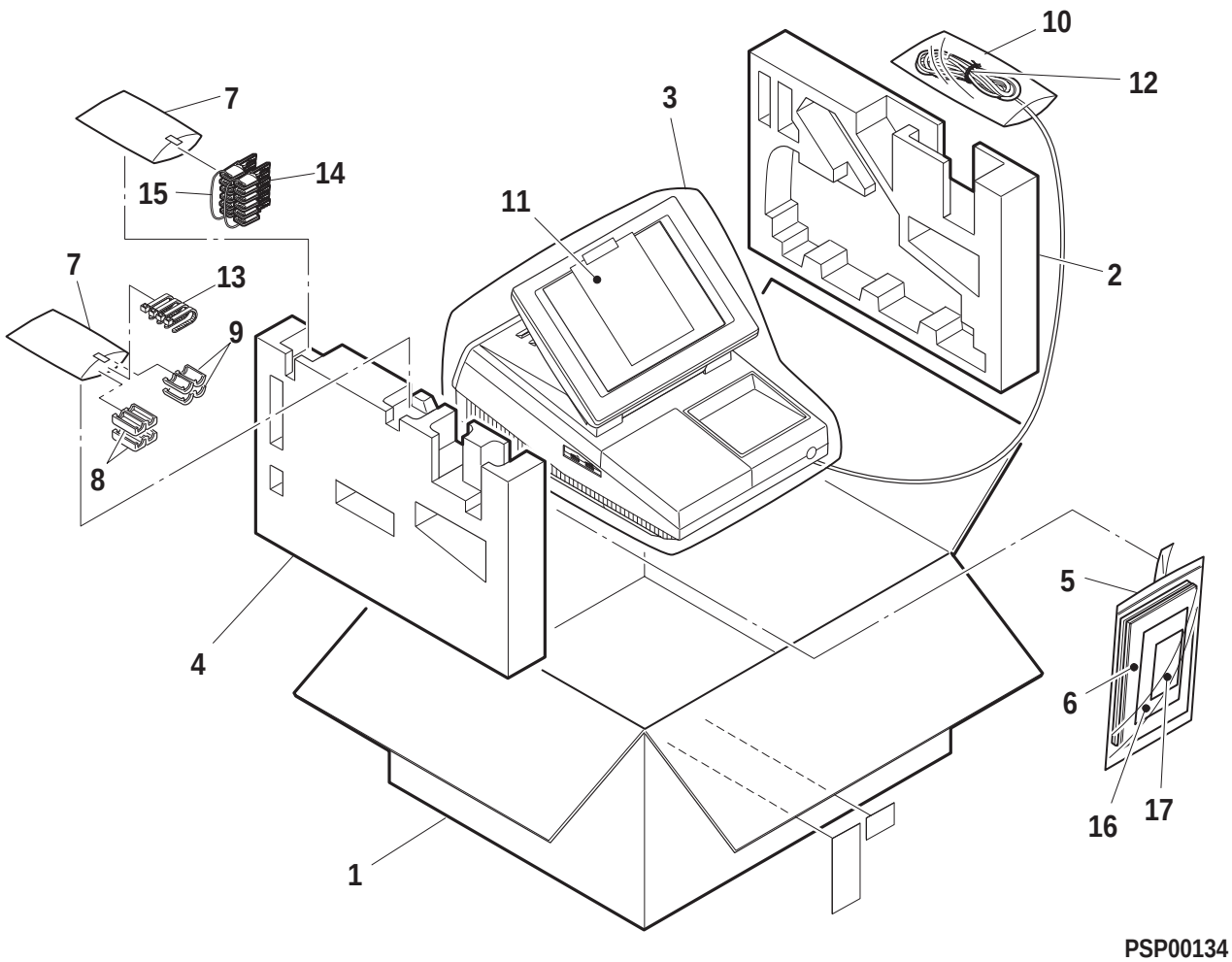
2 Bottom cabinet etc.



3 Packing material & Accessories

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	SPAKC3033BHZZ	AY	N	D	Packing case
2	SPAKA8454BHZZ	AN		D	Packing add R
3	SSAKH0003DHZZ	AE		D	Vinyl bag (640×560mm)
4	SPAKA8455BHZZ	AN		D	Packing add L
5	SSAKH3015CCZZ	AA		D	Vinyl bag (200×300mm)
6	TiNSE2378BHZZ	BM	N	D	Instruction book E
	TiNSF2380BHZZ	BM	N	D	Instruction book F [TQ,TR]
	TiNSG2379BHZZ	BM	N	D	Instruction book G [TQ,TR]
	TiNSS2381BHZZ	BM	N	D	Instruction book S [TQ,TR]
	TiNSE2382BHZZ	BC	N	D	Instruction book E
	TiNSF2384BHZZ	BC	N	D	Instruction book F [TQ,TR]
	TiNSG2383BHZZ	BC	N	D	Instruction book G [TQ,TR]
	TiNSS2385BHZZ	BC	N	D	Instruction book S [TQ,TR]
7	SSAKA5004CCZZ	AA		D	Vinyl bag (100×300mm)
8	RCÖRF6699BHZZ	AU		C	Core (BNF18)
9	RCÖRF6700BHZZ	AS		C	Core (BNF-14)
10	SSAKH4231CCZZ	AA		D	Vinyl bag (140×500mm)
11	TCADH6788BHZA	AC		D	Caution card (Black)
12	UBNDA6630BHZZ	AK		C	AC cord band
13	LBNDJ2003SCZZ	AA		C	Cable band
14	LKGiM1004BH01	AW		B	Clerk key(1) (2pcs/1set,with key ring)
	LKGiM1004BH02	AW		B	Clerk key(2) (2pcs/1set,with key ring)
	LKGiM1004BH03	AW		B	Clerk key(3) (2pcs/1set,with key ring)
	LKGiM1004BH04	AW		B	Clerk key(4) (2pcs/1set,with key ring)
	LKGiM1004BH05	AW		B	Clerk key(5) (2pcs/1set,with key ring)
	LKGiM1004BH06	AW		S	Clerk key(6) (2pcs/1set,with key ring)
15	PRNGT6641BHZZ	AE		C	Key ring
16	TGANE1001BHZC	AG		D	Warranty card [KA]
17	TCADZ2001BHZA	AM		D	Install card [KA]

3 Packing material & Accessories



PSP00134

4 Main PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	QSŌCZ1012AC7B	AP		C	Socket (MM20-72B2-1-T24) [CN9]
2	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF) [C1,2,264]
3	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10µF) [C3,4,9,17,18,49,50,51,52,267,268]
	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10µF) [C306]
4	VCEAPS1CC106M	AC		C	Capacitor (16WV 10µF) [C5,10,11,14,15,24,27,37,44]
5	VCEAPS1HC104M	AD		C	Capacitor (50WV 0.1µF) [C6]
6	VCEAPS1EC476M	AF		C	Capacitor (25WV 47µF) [C26]
7	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF) [C146,183,204,213,215,218,219,222]
	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF) [C225]
8	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF) [C274,275,276]
9	VCCCTV1HH471J	AA		C	Capacitor (50WV 470PF) [C265,266,273,277]
10	VCCCTV1HH150J	AA		C	Capacitor (50WV 15PF) [C270,271]
11	VHDSFPL52V／−1	AC		B	Diode (SFPL52V) [D1A]
12	VHDSFPB54／／−1	AC		B	Diode (SFOB54) [D2A,3A]
13	VHD1SS353／／−1	AB		B	Diode (1SS353) [D30]
14	RCiLZ5017SCZZ	AB		C	Coil (BLM31A02)(RCILZ5017SCZ-) [FB1,2,3,6,7,9,10,11,12]
	RCiLZ5017SCZZ	AB		C	Coil (BLM31A02)(RCILZ5017SCZ-) [FB14,15,6,17,18,19,20,21]
	RCiLZ5017SCZZ	AB		C	Coil (BLM31A02)(RCILZ5017SCZ-) [FB22,23,24,25,26,47,48,49]
	RCiLZ5017SCZZ	AB		C	Coil (BLM31A02)(RCILZ5017SCZ-) [FB50,51,52]
15	VHiTD62308F−1	AH		B	IC (TD62308F) [IC1]
16	VHiMC145406F1	AL		B	IC (MC145406F)(VHIMC145406F-) [IC2,3]
17	VHiSN75189DR／	AK		B	IC (75189) [IC4]
18	VHiSN75115NS1	AN		B	IC (SN75115NS1) [IC5]
19	VHiZ84C0006FE	AT		B	IC (Z84C0006FE) [IC7]
20	VHiZ84C3006FE	AT		B	IC (Z84C3006FE) [IC8]
21	VHiLZ9FT18／−1	AZ		B	IC ((OPC2)LZ9FT18) [IC9]
22	VHiMB62H149−1	BC		B	IC (MB62H149) [IC10]
23	VHiSN74HCU04D	AG		B	IC (SN74HCU04) [IC11]
24	VHiSN74HC00DR	AG		B	IC (SN74HC00DR SOP T) [IC12]
25	VHiSN74HC04DR	AG		B	IC (74HC04) [IC13]
26	VHiSN74HC74D1	AG		B	IC (SN74HC74) [IC14]
27	VHiSN74HC08DR	AL		B	IC (74HC08 SOP) [IC15]
28	VHiBR6265BF10	AR		B	IC (BR6265BF10) [IC16]
29	VHiMC34063AM1	AG		B	IC (MC34063AM1) [IC18A,32A]
30	VHi74LVX32／SJ	AL		B	IC (74LVX32) [IC24,19]
31	VHiLZ9FK13／−1	BA		B	IC (MPCA8)(LZ9FK13) [IC20]
32	VHi74LVX00／SJ	AL		B	IC (74LVX00) [IC22,21]
33	VHiSN74LS393N	AW		B	IC (74LS393) [IC23]
34	VHi2032ARAB1A	AZ		B	IC (ISPLS2032B1A) [IC27]
35	VHi74LV138DR／	AP		B	IC (74LV138) [IC28]
36	VHiH641510810	BA		B	IC (CPU)(H641510810) [IC30]
37	VHiHY514264B6	AW		B	4M DRAM EDO (HY514264B6) [IC33]
38	VHi51V8512T12	BG		B	IC (4M PSRAM)(TC51V8512AFT) [IC37,38]
39	VHiBA10339F−1	AD		B	IC (BA10339F) [IC39A]
40	VHiMN89303／−1	BD		B	IC (MN890303) [IC31]
41	VRS−TS2HD130J	AD		C	Resistor (1/2W 13Ω ±5%) [R9,10]
42	VRS−TS2AD330J	AA		C	Resistor (1/10W 33Ω ±5%) [R271,277,280]
43	VRS−TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%) [R119,167,186,199,201,204,210,211]
	VRS−TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%) [R217]
44	VRS−TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%) [R273]
45	VRS−TS2AD473J	AA		C	Resistor (1/10W 47KΩ ±5%) [R270]
46	VRS−TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%) [R274]
47	VRS−TS2AD105J	AA		C	Resistor (1/10W 1MΩ ±5%) [R272]
48	VRS−TS2AD000J	AA		C	Resistor (1/10W 0Ω ±5%) [R206]
50	VRS−TS2AD153G	AA		C	Resistor (1/10W 15KΩ ±2%) [R265]
51	VRS−TS2AD272G	AB		C	Resistor (1/10W 2.7Ω ±2%) [R269]
52	VRS−TS2AD563J	AA		C	Resistor (1/10W 56KΩ ±5%) [R268]
53	VRS−TS2AD912G	AA		C	Resistor (1/10W 9.1KΩ ±2%) [R266]
54	RCRMZ1016LCZZ	AF		B	Crystal (16MHz(CSTCS16MX040)) [X1]
55	RCRSZ2396RCZZ	AL		B	Chip X-TAL (25.175MHz) [X4]
56	VHi74AHCT245D	AP		B	IC (74AHCT245NS) [IC34]
57	VHi28F016SU70	BR		B	Flash memory (16M FROM)(28F016SU70) [IC29]
58	RMPTQ4330QCJJ	AC		B	Block resistor (33Ω×4 1/16W ±5%) [BR1,2,3,4,5,6,7]
59	VHiW42C3103G／	AU	N	B	IC (W42C31-03) [IC52,53]
60	RCRSZ2399RCZZ	AL	N	B	Crystal (19.6608MHz) [X7]
61	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF) [C57,58,62,259,260,311]
62	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10µF) [C61,76,79,84,91,94,104,106,107]
	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10µF) [C108,109,110,113,115,124A,125,134]
	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10µF) [C142,144,148,150,152,153,168,169]
	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10µF) [C170,182,192,207,221,223A,226,231A]
	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10µF) [C238,244,245,246,,220,254,255,278]
	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10µF) [C279,310]
63	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF) [C63,64,68,69,70,71,74,75,77,78]
	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF) [C98,100,102,111,114,116,117]
	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF) [C118,119,122,123,127,129,130,132]
	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF) [C133,136,138,140,141,143,145,]
	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF) [C147,149,151,155,156,157,158,161]
	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF) [C162,164,165,166,172,173,174,175]
	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF) [C177,178,181,186,193,199,200,203]
	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF) [C210,214,217,224,227,228,230]

4 Main PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
63	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C233,234,236,237,240,241,242]
	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C247,248,249,250,251,252,256,31,33]
	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C35]
64	VCKYTV1HB222K	AA		C	Capacitor (50WV 2200pF)	[C239A,60]
65	VCKYTV1HB332K	AA		C	Capacitor (50WV 3300PF)	[C65]
66	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C66,67,72,73,80,82,85,86,87,88]
	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C89,90,92,93,95,96,97,99,101,126]
	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C135,137,159,160,187,205,253A,261]
	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C262,171,176,179,180,184,185,188]
	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C189,190,191,194,195,197,198,201]
	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C202,206,208,211]
67	VCCCTV1HH221J	AA		C	Capacitor (50WV 220PF)	[C81,121A,128]
68	VCKYTV1CF105Z	AB		C	Capacitor (1µF 16V)	[C105,243]
69	VCKYTV1HB103K	AB		C	Capacitor (50WV 0.010µF)	[C167]
70	VCCCTV1HH100J	AA		C	Capacitor (50WV 10PF)	[C312]
71	VCCCTV1HH8R0J	AC		C	Capacitor (50WV 8pF)	[C209,212,307,308]
72	VCCCTV1HH471J	AA		C	Capacitor (50WV 470PF)	[C196,216A]
73	VCKYTV1HB333K	AA		C	Capacitor (50WV 0.033µF)	[C235A]
74	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C257]
75	VHDSFPB54//-1	AC		B	Diode (SFOB54)	[D9,20A,21A,31]
76	VHD1SS353//-1	AB		B	Diode (1SS353)	[D4,5,6,7,12,22,23,24,25,26,27]
	VHD1SS353//-1	AB		B	Diode (1SS353)	[D28,29]
77	RCiLZ5017SCZZ	AB		C	Chip core (BLM31)(RCILZ5017SCZ-)	[FB33,34,35,36,37,38,39,40]
	RCiLZ5017SCZZ	AB		C	Chip core (BLM31)(RCILZ5017SCZ-)	[FB41,42,43,44,45,46,53,54]
	RCiLZ5017SCZZ	AB		C	Chip core (BLM31)(RCILZ5017SCZ-)	[FB55,56,57,58,59,60,61,62,63]
78	RCORF1008ACZZ	AB		C	Chip bead (BUM21A05)	[FB29,30,31,32]
79	VHViCPS1.0/-1	AF		B	IC protector (ICP-S1.0A)	[F3]
80	VHiSN74HC00DR	AG		B	IC (SN74HC00DR SOP T)	[IC40]
81	VHiBA10393F-1	AC		B	IC (KIA393F SOP)	[IC17A]
82	VHi74LV08/DR/	AK		B	IC (74LV08)	[IC42]
83	VHi74LVX08/SJ	AG		B	IC (74LVX08)	[IC43]
84	VHi74LV14/DR/	AK		B	IC (74LV14)	
85	VHiRH5RE33A-1	AF		B	IC (RX5RE)	[IC45]
86	VSDTC114YK/-1	AC		B	Transistor (DTC114YK)	[Q5]
87	VS2SC4699KP-1	AC		B	Transistor (2SC4699KP)	[Q8,6]
88	VS2SJ187-//-1	AF		B	Transistor (2SJ187)	[Q7,13]
89	VRS-TS2AD330J	AA		C	Resistor (1/10W 33Ω ±5%)	[R142,143,152,157,158,160,161,163]
	VRS-TS2AD330J	AA		C	Resistor (1/10W 33Ω ±5%)	[R164,168,169,173,174,178,179,181]
	VRS-TS2AD330J	AA		C	Resistor (1/10W 33Ω ±5%)	[R182,188,189,192,193,195,275]
90	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R12,14,15,20,21,22,24,27,35,38]
	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R40,41,45,46,47,48,49,51,52,53]
	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R54,56,57,58,59,60,61,62,63,65]
	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R92,93,95,96,97,98,99,101,102]
	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R66,67,68,71,72,73,74,76,82,91]
	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R103,105,106,107,110,112,113,114]
	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R115,116,117,118,120,121,122,123]
	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R124,125,126,127,128,130,132,134]
	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R135,137,139,141,144,147,150,151]
	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R153,154,156,159,165,166,170,171]
	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R172,175,176,177,180,183,185,187]
	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R190,191,194,200,207,212,214,216]
	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R218,219,221,222,224,228,230,231]
	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R233,234,237,241,242,243,247,248]
	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R249,255A,258A,263]
91	VRS-TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%)	[R13,16,17,23,25,28,129,131,155]
	VRS-TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%)	[R238A,261]
92	VRS-TS2AD473J	AA		C	Resistor (1/10W 47KΩ ±5%)	[R18]
93	VRS-TS2AD222J	AA		C	Resistor (1/10W 2.2KΩ ±5%)	[R19]
94	VRS-TS2AD152G	AA		C	Resistor (1/10W 1.5KΩ ±2%)	[R26]
95	VRS-TS2AD561J	AA		C	Resistor (1/10W 560Ω ±5%)	[R29]
96	VRS-TS2AD123J	AA		C	Resistor (1/10W 12KΩ ±5%)	[R30]
97	VRS-TS2AD392G	AA		C	Resistor (1/10W 3.9KΩ ±2%)	[R31]
98	VRS-TS2AD122J	AA		C	Resistor (1/10W 1.2KΩ ±5%)	[R32]
99	VRS-TS2AD153J	AA		C	Resistor (1/10W 15KΩ ±5%)	[R33,229A]
100	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R34,89A,162,184,282]
101	VRS-TS2AD162J	AA		C	Resistor (1/10W 1.6KΩ ±5%)	[R39,37]
102	VRS-TS2AD302J	AA		C	Resistor (1/10W 3.0KΩ ±5%)	[R42,55]
103	VRS-TS2AD334J	AA		C	Resistor (1/10W 330KΩ ±5%)	[R77]
104	VRS-TS2AD105J	AA		C	Resistor (1/10W 1MΩ ±5%)	[R78,109]
105	VRS-TS2AD000J	AA		C	Resistor (1/10W 0Ω ±5%)	[R79,146,149,278,197]
106	VRS-TS2AD562J	AA		C	Resistor (1/10W 5.6KΩ ±5%)	[R86A]
107	VRS-TS2AD100J	AA		C	Resistor (1/10W 10Ω ±5%)	[R100A]
108	VRS-TS2AD362F	AA		C	Resistor (1/10W 3.6KΩ ±1%)	[R104A]
109	VRS-TS2AD122F	AA		C	Resistor (1/10W 1.2KΩ ±1%)	[R108,205A]
110	VRS-TS2AD681J	AA		C	Resistor (1/10W 680Ω ±5%)	[R111]
111	VRS-TS2AD470J	AA		C	Resistor (1/10W 47Ω ±5%)	[R133,136,138,140,145,148]
112	VRS-TS2AD101J	AA		C	Resistor (1/10W 100Ω ±5%)	[R196,198,203,208,209,213,215,220]
	VRS-TS2AD101J	AA		C	Resistor (1/10W 100Ω ±5%)	[R223,225,227,232,236,244,245,246]
113	VRSTS2AD1032F	AB	N	C	Resistor (1/10W 10.3KΩ ±5%)	[R202A]
114	VRS-TS2AD432J	AA		C	Resistor (1/10W 4.3KΩ ±5%)	[R251A,226A]

4 Main PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
115	VRS−TS2AD143F	AB		C	Resister (1/10W 14KΩ ±1%)	[R235A]
116	VRS−TS2AD223J	AA		C	Resistor (1/10W 22KΩ ±5%)	[R239]
117	VRS−TS2AD802J	AB	N	C	Resistor (1/10W 8.0KΩ ±5%)	[R240]
118	VRS−TS2AD622J	AA		C	Resistor (1/10W 6.2KΩ ±5%)	[R250A]
119	VRS−TS2AD112J	AA		C	Resistor (1/10W 1.1KΩ ±5%)	[R252A]
120	VRS−TS2AD152J	AA		C	Resistor (1/10W 1.5KΩ ±5%)	[R260A,253A]
121	VRS−TS2AD303F	AA		C	Resistor (1/10W 30KΩ ±1%)	[R254A]
122	VRS−TS2AD104J	AA		C	Resistor (1/10W 100KΩ ±5%)	[R256A]
123	VRS−TS2AD512F	AA		C	Resistor (1/10W 5.1KΩ ±1%)	[R257A]
124	VRS−TS2AD513J	AA		C	Resistor (1/10W 51KΩ ±5%)	[R259A]
125	VRS−TS2AD272J	AA		C	Resistor (1/10W 2.7KΩ ±5%)	[R267]
126	VHERD5.6PB／−1	AD		B	Zener diode (RD5.6PB)	[ZD4A]
127	VHERD30PB／／−1	AD		B	Zener diode (RD30PB)	[ZD5A]
128	VHEUDZ33B／／−1	AC		B	Zener diode (32.15-33.79)(UDZ33B)	[ZD6A]
129	VHiH4728B02FS	AW		B	IC (CKDC9)(H4728B02FS)	[IC50]
130	VHiUPD71037GB	AY		B	IC (UPD71037GB)	[IC41]
131	VHi74HC138DR／	AK		B	IC (SN74HC138DR)	[IC48,49]
132	VHiSN74LS125R	AL		B	IC (SN74LS125DR)	[IC46,47]
133	VS2SA1270−／−1	AF		B	Transistor (KTA1270)	[Q1A]
134	RCRSP5019BCZZ	AD		B	Crystal (7.37MHz)	[X2]
135	VCEAGA1HW224M	AA		C	Capacitor (50WV 0.22µF)	[C7]
136	VCEAEU1CW106M	AA		C	Capacitor (16WV 10µF)	[C41,29,269]
137	RC−EZ106ARC1A	AD		C	Capacitor (10WV 10µF)	[C30,43,34,305,309]
138	VCQYNA2AM103K	AA		C	Capacitor (100WV 0.10µF)	[C38A]
139	VCEAGA1HW106M	AA		C	Capacitor (50WV 10µF)	[C40A]
140	VCEAGA1HW107M	AA		C	Capacitor (50WV 100µF)	[C45A,46A,313]
141	VCQYNU1HM153K	AA		C	Capacitor (50WV 0.015µF)	[C48A]
142	VCEAGA1HW105M	AB		C	Capacitor (50WV 1µF)	[C263]
143	RCiLZ1003BHZZ	AF		C	Dip coil (BFW7550R2)	[FB64,65]
144	RCŌRF6691BHZZ	AD		C	Core (BFS3550R2F)	[FB8]
145	RCŌRF6702BHZZ	AF		C	EMI filter (100pF)	[FL1,2,3]
146	QFSHD2109AFZZ	AC		C	Fuse holder (HD2109AF)	[F2A,3A,4A]
147	PRDAF6667BHZZ	AH		C	Heat sink	[IC36A]
148	QCNCM1101BHZZ	AC		C	Connector (5273-02A)(2P)	[CN7A]
149	QCNCM7075BH0B	AB		C	Connector (5045-03A)	[CN2]
150	QCNCM7142BH1B	AD		C	Connector (GIL-G-12P-S3TS-E)	[CN13]
151	QCNCM7176BH0E	AC		C	Connector (53014-0510)	[CN3]
153	QCNCM7207BH4J	AQ		C	Connector (40pin)(6229ZIF)	[CN6]
154	QCNCM7226BH0H	AE		C	Connector (MLX53015-0810)	[CN14]
155	QCNCW7081BHZZ	AB		C	Connector (2P)(5267-02A)(Blue)	[BTCN1]
156	QCNCW7204RC8J	AM		C	I/O connector (80PIN;ST 10-5061-080)	[CN4,10,11]
157	QCNW−2989BHZZ	AF		C	GND wire	
158	QCNW−2990BHZZ	AP		C	GND wire	
⚠ 160	QFS−C1035CCZZ	AE		A	Fuse (250V/1.6A)	[F2A]
⚠ 161	QFS−C5012BHZZ	AF		A	Fuse (T500mAL 250V)	[F3A,4A]
162	QSŌCZ6428ACZZ	AE		C	IC socket (28pin)(DICF-28C-E)	[IC26]
163	QSW−S6894BHZZ	AK		B	Slide switch	[S1]
164	RALMB6640RCZZ	AF		B	Buzzer (SMX06)	[BZ1]
165	RC−EZ2271RC1A	AM		C	Capacitor (10WV 220µF)	[C20A]
166	RC−EZ336ARC1A	AB		C	Capacitor (10WV 33µF)	[C8,28]
167	RCiLC6647BHZZ	AK		C	Coil (220µH)	[L3A]
168	RCiLC6652RCZZ	AK		C	Coil (24V)(MC182-201M)	[L4A]
169	RCiLC6653BHZZ	AS		C	Choke coil (180µH)	[L2A]
170	RCiLF0050FCZZ	AG		C	Coil	[FB4,5,13,27]
171	RCRSP6676RCZZ	AG		B	Crystal (DT38 32.768KHz)	[X5]
172	RCRSZ6644RCZZ	AD		B	Crystal (4.19MHz)	[X6]
⚠ 173	RTRNH6894RCZZ	AU		B	Converter transformer (see-16)	[T1A]
174	RVR−M2415QCN3	AE		B	Variable resistor (20K)	[VR1]
175	VCEAGD1CW108M	AE	N	C	Capacitor (16WV 1000µF)	[C22A]
176	VCEAGU1HW108M	AF		C	Capacitor (50WV 1000µF)	[C47A]
177	VCEAGU1HW477M	AD		C	Capacitor (50WV 470µF)	[C32A]
178	VCEAGU1HW478M	AL		C	Capacitor (50WV 4700µF)	[C36A]
179	VHDCP301／／／−1	AL		B	Diode (CP301)	[BD1A]
180	VHEMTZ5.1A／−1	AC		B	Zener diode (MTZ5.1A)	[ZD7]
181	VHEMTZJ13C／−1	AA	N	B	Zener diode (MTZJ13C)	[ZD1A]
182	VHiKiA7806P−1	AK		B	IC (KIA7806P)	[IC6]
183	VHiL4960／／／−1	AM		B	IC (L4960)	[IC36A]
184	VHi27256RDH1A	AW		B	EP ROM (27256RDH1A)	[IC26]
185	VHiMC68B54／−1	BB		B	IC (MC6BB54P)	[IC25]
186	VRD−RC2EY221J	AA		C	Resistor (1/4W 220Ω ±5%)	[R1]
187	VRS−RE3AAR39J	AB		C	Resistor (1W 0.39Ω ±5%)	[R11A]
188	VRS−RE3LA151J	AC		C	Resistor (3.0W 150Ω ±5%)	[R2]
189	VS2SC4352／／−1	AF		B	Transistor (2SC4352)	[Q4A]
190	VS2SC4153／／−1	AH		B	Transistor (2SC4153)	[Q3A]
191	XBPSD30P08KS0	AA		C	Screw (3×8KS)	[IC36A]
192	QCNCM2788BH0i	BL		C	D-SUB connector (Straight type)	[CN18,19]
193	QCNCM7057BH08	AG		C	Connector (MLX 5045-0810)	[CN17]
194	QCNCM7057BHZZ	AB		C	Connector (5045-3)(3pin)	[CN15,16]
195	QCNCM7176BH1J	AD		C	Connector (53014-1010)	[CN20,21]
196	RVR−B5310QCZZ	AG		B	Volume (20K)	[VR2,3]

4 Main PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
197	VHiKiA7045F-1	AL	N	B	IC (KIA7045)	[IC54]
198	QCNW-3022BHZZ	AE	N	C	GND wire	
199	VRS-TS2AD472F	AA		C	Resistor (1/10W 4.7KΩ ±1%)	[R238A]
	(Unit)					
901	CPWBX2824BH01	CZ	N	E	Main PWB unit	

5 Mother PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	QCNCM7203RC8J	AN		C	Option connector (20-5061-080)	[CN12]
2	QCNCW7204RC8J	AM		C	I/O connector (80PIN;ST 10-5061-080)	[CN4,10,11]
3	VCEAPS1EC476M	AF		C	Capacitor (25WV 47μF)	[C53]
	(Unit)					
901	CPWBX7569BH01	CA		E	Mother PWB unit	

6 Touch panel PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	QCNCW7217RC3J	AK		C	Connector (ELCO 04-6239-030-001-800)	[CN3]
2	RCiLZ5017SCZ/	AF		C	Chip core (BLM31)	[FB1,3,5]
3	RCRMZ7002RCZZ	AE		B	Crystal (8 MHz)	[X1]
4	VCCCTV1HH331J	AA		C	Capacitor (50WV 330pF)	[C15,16]
5	VCCCTV1HH681J	AA		C	Capacitor (50WV 680PF)	[C1]
6	VCEAPS1CC336M	AF		C	Capacitor (16WV 33μF)	[C10,11]
7	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C14]
8	VCKYTV1HB182K	AA		C	Capacitor (50WV 1800PF)	[C3,4,5,6]
9	VCKYTV1HB472K	AA		C	Capacitor (50WV 4700pF)	[C2]
10	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C7,8,9]
11	VHD1SS353//-1	AB		B	Diode (1SS353)	[D1,2,3,4,5,6,7,8]
12	VHiM89635N010	BA		B	IC (MB89635R)	[IC2]
13	VHiS29390AFJA	AL		B	IC (E2PROM)(S-29390AF)	[IC1]
14	VRS-TS2AD102J	AA		C	Resistor (1/10W 1.0KΩ ±5%)	[R2]
15	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R4,5,6,7,8,9,10]
16	VRS-TS2AD203J	AA		C	Resistor (1/10W 20KΩ ±5%)	[R3]
17	VRS-TS2AD822J	AA		C	Resistor (1/10W 8.2KΩ ±5%)	[R1]
18	VSDTA124EK/-1	AD		B	Transistor (DTA124EKA)	[Q1,3,5]
19	VSDTC124TK/-1	AD		B	Transistor (DTC124TKA)	[Q4,2]
20	VRS-TQ2BB000J	AA		C	Resistor (1/8W 0Ω ±5%)	[FB2,4]
21	RC-EZ106ARC1A	AD		C	Capacitor (10WV 10μF)	[C26]
22	RC-KZ1054CCZZ	AB		C	Capacitor (50WV 0.1μF)	[C24,25]
23	QCNCM7226BH0E	AD		C	Connector (MLX53015-0510)	[CN4]
24	QCNCM7230BH1E	AL		C	Connector (00-6200-157-012-800)	[CN1]
25	QCNCM7207BH4J	AQ		C	Connector (40P)(6229ZiF DIP)	[CON1]
26	QCNW-2994BHZZ	AE		C	GND wire	
	(Unit)					
901	CPWBN7571BH01	BR		E	Touch panel PWB unit	

7 N/F PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	VRD-RB2HY394J	AA		C	Resistor (1/2W 390KΩ ±5%)	[R1A]
2	QCNCW7199BH0E	AE		C	Connector (35328-0510)	[CN2A]
⚠ 3	QFS-D4341CCZZ	AE		A	Fuse (SEMCO T1A/250V)	[F1A]
4	QFSHD2109AFZZ	AC		C	Fuse holder (HD2109AF)	[F1A]
5	QTANN6658RCZZ	AH		C	Block terminal	[CN1A]
6	RC-FZ1041RC2E	AE		C	Capacitor (250WV 0.1μF)	[C1A,2A]
7	RCiLC6654BHZZ	AR		C	Coil	[L1A]
8	QCNW-2982BHZZ	AN		C	AC cable	[L1,N1]
9	QSW-C1262QCZZ	AR		B	Power switch (AJ7241B)	[SW1A]
10	RCÖRF6695BHZZ	AK		C	Core (CP14A)	
11	LBNDJ2003SCZZ	AA		C	Cable band	
	(Unit)					
901	CPWBF7573BH02	BH	N	E	N/F PWB unit	[KA,KB]
	CPWBF7573BH03	BH	N	E	N/F PWB unit	[TQ,TS]

8 Invertor PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	QCNCM2656RC0C	AE		C	Connector (BHR-03VS-1) [CN501A]
2	RC-CZ2201RC0F	AE		C	Capacitor (22pF/3.15KV) [C504A]
3	RCiLC6667BHZZ	AN		C	Coil (100µH SMD) [L501A]
⚠ 4	RTRNH9521BHZZ	BB		B	Transformer (841TN-1157) [T501A]
5	VHiLT1184CS-1	BE		B	IC (LT1184) [IC501A]
6	VCEAPS1CC225M	AF		C	Capacitor (2.2µF/16V) [C501A]
7	VCEAPS1CC226M	AC		C	Capacitor (16WV 22µF) [C502A]
8	VRS-TS2AD133F	AA		C	Resistor (1/10W 13KΩ ±1%) [R501A]
9	VRS-TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%) [R502A]
10	RC-FZ8231RC2A	AG		C	Capacitor (0.082µF/100V) [C601A]
11	VCKYTV1CF105Z	AB		C	Capacitor (16WV 1µF) [C602A]
12	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF) [C103]
13	VHDSFPB54//-1	AC		B	Diode (SFPB54) [D601A,602A]
14	VHViCPS0.5//-1	AF		B	IC-protector (ICPS0.5) [F601A]
15	VRS-TS2AD104J	AA		C	Resistor (1/10W 100KΩ ±5%) [R601A]
16	VRS-TS2AD222J	AA		C	Resistor (1/10W 2.2KΩ ±5%) [R603A,604A]
17	VRS-TS2AD224J	AA		C	Resistor (1/10W 220KΩ ±5%) [R602A]
18	VS2SD2391//-1	AD		B	Transistor (2SD2391Q) [Q601A,602A]
19	QCNCM7226BH0E	AD		C	Connector (MLX53015-0510) [CN502]
	(Unit)				
901	CPWBN2794BH01	BQ		E	Inverter PWB unit

9 IR PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	VCCCTV1HH331J	AA		C	Capacitor (50WV 330pF) [C106]
2	VCEAPS1CC475M	AG		C	Capacitor (4.7µF/16V) [C104]
3	VCKYTV1HB333K	AA		C	Capacitor (50WV 0.033µF) [C101]
4	VCKYTV1HB334K	AE		C	Capacitor (50WV 0.33µF) [C102]
5	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10µF) [C103]
6	VHPRPM851//-1	AT		B	Photo coupler (RPM851) [IC101]
7	VRS-TQ2BB331J	AA		C	Resistor (1/8W 330Ω ±5%) [R104]
8	VRS-TQ2BB340J	AB		C	Resistor (1/8W 34Ω ±5%) [R101,102]
9	VRS-TQ2BB470J	AB		C	Resistor (1/8W 47Ω ±5%) [R103]
10	QSW-S2403BHZZ	AW		B	SL-switch [S101]
11	QCNCM7226BH0E	AD		C	Connector (MLX53015-0510) [CN101]
12	RC-EZ106ARC1A	AD		C	Capacitor (10WV 10µF) [C105]
13	LANGQ7648BHZZ	AG		C	IR slide plate
14	QCNW-2994BHZZ	AE		C	GND wire
	(Unit)				
901	CPWBN2799BH01	BN		E	IR PWB unit

10 LCD PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	QCNCW7217RC3J	AK		C	Connector (30pin)(04-6239-030-001-800) [CN2]
2	QCNCW1230AC3A	AK		C	Connector (31pin) [CN1]
	(Unit)				
901	CPWBN2789BH01	BA		E	LCD PWB unit

11 Service route options & Service tools

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	QCNCM7145RCZZ	AZ		S	Terminator (50Ω) [for SRN in-line system]
2	UKŌG-6718RCZZ	BE		S	MCR test card [for UP-E12MR2]
3	UKŌG-6705RCZZ	BC		S	RS232 loop back connector [for RS232 connector]
4	CKŌG-6724BHZZ	BQ		S	Expansion PWB
11	LKGiM1004BH07	BH		S	Clerk key(7) (2pcs/1set,with key ring)
12	LKGiM1004BH08	BH		S	Clerk key(8) (2pcs/1set,with key ring)
13	LKGiM1004BH09	BH		S	Clerk key(9) (2pcs/1set,with key ring)
14	LKGiM1004BH10	BH		S	Clerk key(10) (2pcs/1set,with key ring)
15	LKGiM1004BH11	BH		S	Clerk key(11) (2pcs/1set,with key ring)
16	LKGiM1004BH12	BH		S	Clerk key(12) (2pcs/1set,with key ring)
17	LKGiM1004BH13	BH		S	Clerk key(13) (2pcs/1set,with key ring)
18	LKGiM1004BH14	BH		S	Clerk key(14) (2pcs/1set,with key ring)
19	LKGiM1004BH15	BH		S	Clerk key(15) (2pcs/1set,with key ring)
20	LKGiM1004BH16	BH		S	Clerk key(16) (2pcs/1set,with key ring)
21	LKGiM1004BH17	BH		S	Clerk key(17) (2pcs/1set,with key ring)

11 Service route options & Service tools

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
22	LKGiM1004BH18	BH		S	Clerk key(18) (2pcs/1set,with key ring)
23	LKGiM1004BH19	BH		S	Clerk key(19) (2pcs/1set,with key ring)
24	LKGiM1004BH20	BH		S	Clerk key(20) (2pcs/1set,with key ring)
25	LKGiM1004BH21	BH		S	Clerk key(21) (2pcs/1set,with key ring)
26	LKGiM1004BH22	BH		S	Clerk key(22) (2pcs/1set,with key ring)
27	LKGiM1004BH23	BH		S	Clerk key(23) (2pcs/1set,with key ring)
28	LKGiM1004BH24	BH		S	Clerk key(24) (2pcs/1set,with key ring)
29	LKGiM1004BH25	BH		S	Clerk key(25) (2pcs/1set,with key ring)
30	LKGiM1004BH26	BH		S	Clerk key(26) (2pcs/1set,with key ring)
31	LKGiM1004BH27	BH		S	Clerk key(27) (2pcs/1set,with key ring)
32	LKGiM1004BH28	BH		S	Clerk key(28) (2pcs/1set,with key ring)
33	LKGiM1004BH29	BH		S	Clerk key(29) (2pcs/1set,with key ring)
34	LKGiM1004BH30	BH		S	Clerk key(30) (2pcs/1set,with key ring)
35	LKGiM1004BH31	BH		S	Clerk key(31) (2pcs/1set,with key ring)
36	LKGiM1004BH32	BH		S	Clerk key(32) (2pcs/1set,with key ring)
37	LKGiM1004BH33	BH		S	Clerk key(33) (2pcs/1set,with key ring)
38	LKGiM1004BH34	BH		S	Clerk key(34) (2pcs/1set,with key ring)
39	LKGiM1004BH35	BH		S	Clerk key(35) (2pcs/1set,with key ring)
40	LKGiM1004BH36	BH		S	Clerk key(36) (2pcs/1set,with key ring)
41	LKGiM1004BH37	BH		S	Clerk key(37) (2pcs/1set,with key ring)
42	LKGiM1004BH38	BH		S	Clerk key(38) (2pcs/1set,with key ring)
43	LKGiM1004BH39	BH		S	Clerk key(39) (2pcs/1set,with key ring)
44	LKGiM1004BH40	BH		S	Clerk key(40) (2pcs/1set,with key ring)
45	LKGiM1004BH41	BH		S	Clerk key(41) (2pcs/1set,with key ring)
46	LKGiM1004BH42	BH		S	Clerk key(42) (2pcs/1set,with key ring)
47	LKGiM1004BH43	BH		S	Clerk key(43) (2pcs/1set,with key ring)
48	LKGiM1004BH44	BH		S	Clerk key(44) (2pcs/1set,with key ring)
49	LKGiM1004BH45	BH		S	Clerk key(45) (2pcs/1set,with key ring)
50	LKGiM1004BH46	BH		S	Clerk key(46) (2pcs/1set,with key ring)
51	LKGiM1004BH47	BH		S	Clerk key(47) (2pcs/1set,with key ring)
52	LKGiM1004BH48	BH		S	Clerk key(48) (2pcs/1set,with key ring)
53	LKGiM1004BH49	BH		S	Clerk key(49) (2pcs/1set,with key ring)
54	LKGiM1004BH50	BH		S	Clerk key(50) (2pcs/1set,with key ring)
55	LKGiM1004BH51	BH		S	Clerk key(51) (2pcs/1set,with key ring)
56	LKGiM1004BH52	BH		S	Clerk key(52) (2pcs/1set,with key ring)
57	LKGiM1004BH53	BH		S	Clerk key(53) (2pcs/1set,with key ring)
58	LKGiM1004BH54	BH		S	Clerk key(54) (2pcs/1set,with key ring)
59	LKGiM1004BH55	BH		S	Clerk key(55) (2pcs/1set,with key ring)
60	LKGiM1004BH56	BH		S	Clerk key(56) (2pcs/1set,with key ring)
61	LKGiM1004BH57	BH		S	Clerk key(57) (2pcs/1set,with key ring)
62	LKGiM1004BH58	BH		S	Clerk key(58) (2pcs/1set,with key ring)
63	LKGiM1004BH59	BH		S	Clerk key(59) (2pcs/1set,with key ring)
64	LKGiM1004BH60	BH		S	Clerk key(60) (2pcs/1set,with key ring)
65	LKGiM1004BH61	BH		S	Clerk key(61) (2pcs/1set,with key ring)
66	LKGiM1004BH62	BH		S	Clerk key(62) (2pcs/1set,with key ring)
67	LKGiM1004BH63	BH		S	Clerk key(63) (2pcs/1set,with key ring)
68	LKGiM1004BH64	BH		S	Clerk key(64) (2pcs/1set,with key ring)
69	LKGiM1004BH65	BH		S	Clerk key(65) (2pcs/1set,with key ring)
70	LKGiM1004BH66	BH		S	Clerk key(66) (2pcs/1set,with key ring)
71	LKGiM1004BH67	BH		S	Clerk key(67) (2pcs/1set,with key ring)
72	LKGiM1004BH68	BH		S	Clerk key(68) (2pcs/1set,with key ring)
73	LKGiM1004BH69	BH		S	Clerk key(69) (2pcs/1set,with key ring)
74	LKGiM1004BH70	BH		S	Clerk key(70) (2pcs/1set,with key ring)
75	LKGiM1004BH71	BH		S	Clerk key(71) (2pcs/1set,with key ring)
76	LKGiM1004BH72	BH		S	Clerk key(72) (2pcs/1set,with key ring)
77	LKGiM1004BH73	BH		S	Clerk key(73) (2pcs/1set,with key ring)
78	LKGiM1004BH74	BH		S	Clerk key(74) (2pcs/1set,with key ring)
79	LKGiM1004BH75	BH		S	Clerk key(75) (2pcs/1set,with key ring)
80	LKGiM1004BH76	BH		S	Clerk key(76) (2pcs/1set,with key ring)
81	LKGiM1004BH77	BH		S	Clerk key(77) (2pcs/1set,with key ring)
82	LKGiM1004BH78	BH		S	Clerk key(78) (2pcs/1set,with key ring)
83	LKGiM1004BH79	BH		S	Clerk key(79) (2pcs/1set,with key ring)
84	LKGiM1004BH80	BH		S	Clerk key(80) (2pcs/1set,with key ring)
85	LKGiM1004BH81	BH		S	Clerk key(81) (2pcs/1set,with key ring)
86	LKGiM1004BH82	BH		S	Clerk key(82) (2pcs/1set,with key ring)
87	LKGiM1004BH83	BH		S	Clerk key(83) (2pcs/1set,with key ring)
88	LKGiM1004BH84	BH		S	Clerk key(84) (2pcs/1set,with key ring)
89	LKGiM1004BH85	BH		S	Clerk key(85) (2pcs/1set,with key ring)
90	LKGiM1004BH86	BH		S	Clerk key(86) (2pcs/1set,with key ring)
91	LKGiM1004BH87	BH		S	Clerk key(87) (2pcs/1set,with key ring)
92	LKGiM1004BH88	BH		S	Clerk key(88) (2pcs/1set,with key ring)
93	LKGiM1004BH89	BH		S	Clerk key(89) (2pcs/1set,with key ring)
94	LKGiM1004BH90	BH		S	Clerk key(90) (2pcs/1set,with key ring)
95	LKGiM1004BH91	BH		S	Clerk key(91) (2pcs/1set,with key ring)
96	LKGiM1004BH92	BH		S	Clerk key(92) (2pcs/1set,with key ring)
97	LKGiM1004BH93	BH		S	Clerk key(93) (2pcs/1set,with key ring)
98	LKGiM1004BH94	BH		S	Clerk key(94) (2pcs/1set,with key ring)
99	LKGiM1004BH95	BH		S	Clerk key(95) (2pcs/1set,with key ring)
100	LKGiM1004BH96	BH		S	Clerk key(96) (2pcs/1set,with key ring)
101	LKGiM1004BH97	BH		S	Clerk key(97) (2pcs/1set,with key ring)

11 Service route options & Service tools

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
102	L K G i M 1 0 0 4 B H 9 8	BH		S	Clerk key(98) (2pcs/1set,with key ring)
103	L K G i M 1 0 0 4 B H 9 9	BH		S	Clerk key(99) (2pcs/1set,with key ring)
104	L K G i M 1 0 0 4 B H 0 0	BH		S	Clerk key(100) (2pcs/1set,with key ring)
105	L K G i M 1 0 0 4 B H A 1	BH		S	Clerk key(101) (2pcs/1set,with key ring)
106	L K G i M 1 0 0 4 B H A 2	BH		S	Clerk key(102) (2pcs/1set,with key ring)
107	L K G i M 1 0 0 4 B H A 3	BH		S	Clerk key(103) (2pcs/1set,with key ring)
108	L K G i M 1 0 0 4 B H A 4	BH		S	Clerk key(104) (2pcs/1set,with key ring)
109	L K G i M 1 0 0 4 B H A 5	BH		S	Clerk key(105) (2pcs/1set,with key ring)
110	L K G i M 1 0 0 4 B H A 6	BH		S	Clerk key(106) (2pcs/1set,with key ring)
111	L K G i M 1 0 0 4 B H A 7	BH		S	Clerk key(107) (2pcs/1set,with key ring)
112	L K G i M 1 0 0 4 B H A 8	BH		S	Clerk key(108) (2pcs/1set,with key ring)
113	L K G i M 1 0 0 4 B H A 9	BH		S	Clerk key(109) (2pcs/1set,with key ring)
114	L K G i M 1 0 0 4 B H A 0	BH		S	Clerk key(110) (2pcs/1set,with key ring)
115	L K G i M 1 0 0 4 B H B 1	BH		S	Clerk key(111) (2pcs/1set,with key ring)
116	L K G i M 1 0 0 4 B H B 2	BH		S	Clerk key(112) (2pcs/1set,with key ring)
117	L K G i M 1 0 0 4 B H B 3	BH		S	Clerk key(113) (2pcs/1set,with key ring)
118	L K G i M 1 0 0 4 B H B 4	BH		S	Clerk key(114) (2pcs/1set,with key ring)
119	L K G i M 1 0 0 4 B H B 5	BH		S	Clerk key(115) (2pcs/1set,with key ring)
120	L K G i M 1 0 0 4 B H B 6	BH		S	Clerk key(116) (2pcs/1set,with key ring)
121	L K G i M 1 0 0 4 B H B 7	BH		S	Clerk key(117) (2pcs/1set,with key ring)
122	L K G i M 1 0 0 4 B H B 8	BH		S	Clerk key(118) (2pcs/1set,with key ring)
123	L K G i M 1 0 0 4 B H B 9	BH		S	Clerk key(119) (2pcs/1set,with key ring)
124	L K G i M 1 0 0 4 B H B 0	BH		S	Clerk key(120) (2pcs/1set,with key ring)
125	L K G i M 1 0 0 4 B H C 1	BH		S	Clerk key(121) (2pcs/1set,with key ring)
126	L K G i M 1 0 0 4 B H C 2	BH		S	Clerk key(122) (2pcs/1set,with key ring)
127	L K G i M 1 0 0 4 B H C 3	BH		S	Clerk key(123) (2pcs/1set,with key ring)
128	L K G i M 1 0 0 4 B H C 4	BH		S	Clerk key(124) (2pcs/1set,with key ring)
129	L K G i M 1 0 0 4 B H C 5	BH		S	Clerk key(125) (2pcs/1set,with key ring)
130	L K G i M 1 0 0 4 B H C 6	BH		S	Clerk key(126) (2pcs/1set,with key ring)

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PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
【C】					
CKŌG-6724BHZZ	11- 4	BQ		S	
CPWBF7573BH02	2- 22	BH	N	E	
〃	7-901	BH	N	E	
CPWBF7573BH03	2- 22	BH	N	E	
〃	7-901	BH	N	E	
CPWBN2789BH01	1- 21	BA		E	
〃	10-901	BA		E	
CPWBN2794BH01	1- 25	BQ		E	
〃	8-901	BQ		E	
CPWBN2799BH01	2- 35	BN		E	
〃	9-901	BN		E	
CPWBN7571BH01	1- 23	BR		E	
〃	6-901	BR		E	
CPWBX2824BH01	2- 28	CZ	N	E	
〃	4-901	CZ	N	E	
CPWBX7569BH01	2- 12	CA		E	
〃	5-901	CA		E	
【G】					
GCABA7871BHZZ	2- 38	BF		D	
GCABB7870BHZZ	1- 41	BB		D	
GCABE7872BHZZ	1- 34	AX		D	
GCABF7873BHZZ	1- 7	BA		D	
GCŌVA7158BHZZ	1- 48	AW		D	
GCŌVA7159BHZZ	1- 35	AS		D	
GCŌVA7166BHZZ	1- 37	AP		D	
GCŌVH2472BHZZ	2- 42	BA		D	
GCŌVH7160BHZZ	2- 46	AN		D	
GCŌVH7161BHZZ	2- 56	AN		D	
GCŌVH7167BHZZ	1- 24	AH		D	
GFTAT6927BHZZ	1- 42	AR		D	
GFTAT6928BHZZ	1- 47	AV		D	
GFTAU2426BHZZ	2- 43	AR		D	
GLEGG6659BHZZ	2- 53	AE		D	
GSTN-2005BHZZ	1- 1	AT		D	
【H】					
HPNLC6839RCZZ	1- 31	BT		D	
【J】					
JKNBZ2411BHZZ	1- 2	AH		C	
JKNBZ6923BHZZ	1- 40	AP		C	
【L】					
LANGK2805BHZZ	2- 27	AQ		C	
LANGK2807BHZZ	2- 33	AQ		C	
LANGK7649BHZZ	1- 17	AV		C	
LANGK7650BHZZ	1- 46	AH		C	
LANGK7651BHZZ	1- 36	AL		C	
LANGK7657BHZZ	2- 62	AK	N	C	
LANGQ7648BHZZ	9- 13	AG		C	
LANGT2808BHZZ	2- 9	AK		C	
LANGT2847BHZZ	1- 52	AP	N	C	
LANGT7637BHZZ	2- 11	AT		C	
LANGT7638BHZZ	2- 8	AM		C	
LANGT7640BHZZ	2- 13	AR		C	
LANGT7641BHZA	2- 17	AQ	N	C	
LBNDJ2003SCZZ	2- 23	AA		C	
〃	3- 13	AA		C	
〃	7- 11	AA		C	
LCHSM6709BHZZ	2- 36	AX		C	
LHLDK6847BHZZ	2- 54	AN		C	
LHLDW0006SCZZ	2- 39	AB		C	
LHLDW2365BHZZ	2- 41	AG		C	
LKGiM1004BH00	11-104	BH		S	
LKGiM1004BH01	3- 14	AW		B	
LKGiM1004BH02	3- 14	AW		B	
LKGiM1004BH03	3- 14	AW		B	
LKGiM1004BH04	3- 14	AW		B	
LKGiM1004BH05	3- 14	AW		B	
LKGiM1004BH06	3- 14	AW		S	
LKGiM1004BH07	11- 11	BH		S	
LKGiM1004BH08	11- 12	BH		S	
LKGiM1004BH09	11- 13	BH		S	
LKGiM1004BH10	11- 14	BH		S	
LKGiM1004BH11	11- 15	BH		S	
LKGiM1004BH12	11- 16	BH		S	
LKGiM1004BH13	11- 17	BH		S	
LKGiM1004BH14	11- 18	BH		S	
LKGiM1004BH15	11- 19	BH		S	
LKGiM1004BH16	11- 20	BH		S	
LKGiM1004BH17	11- 21	BH		S	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
LKGiM1004BH18	11- 22	BH		S	
LKGiM1004BH19	11- 23	BH		S	
LKGiM1004BH20	11- 24	BH		S	
LKGiM1004BH21	11- 25	BH		S	
LKGiM1004BH22	11- 26	BH		S	
LKGiM1004BH23	11- 27	BH		S	
LKGiM1004BH24	11- 28	BH		S	
LKGiM1004BH25	11- 29	BH		S	
LKGiM1004BH26	11- 30	BH		S	
LKGiM1004BH27	11- 31	BH		S	
LKGiM1004BH28	11- 32	BH		S	
LKGiM1004BH29	11- 33	BH		S	
LKGiM1004BH30	11- 34	BH		S	
LKGiM1004BH31	11- 35	BH		S	
LKGiM1004BH32	11- 36	BH		S	
LKGiM1004BH33	11- 37	BH		S	
LKGiM1004BH34	11- 38	BH		S	
LKGiM1004BH35	11- 39	BH		S	
LKGiM1004BH36	11- 40	BH		S	
LKGiM1004BH37	11- 41	BH		S	
LKGiM1004BH38	11- 42	BH		S	
LKGiM1004BH39	11- 43	BH		S	
LKGiM1004BH40	11- 44	BH		S	
LKGiM1004BH41	11- 45	BH		S	
LKGiM1004BH42	11- 46	BH		S	
LKGiM1004BH43	11- 47	BH		S	
LKGiM1004BH44	11- 48	BH		S	
LKGiM1004BH45	11- 49	BH		S	
LKGiM1004BH46	11- 50	BH		S	
LKGiM1004BH47	11- 51	BH		S	
LKGiM1004BH48	11- 52	BH		S	
LKGiM1004BH49	11- 53	BH		S	
LKGiM1004BH50	11- 54	BH		S	
LKGiM1004BH51	11- 55	BH		S	
LKGiM1004BH52	11- 56	BH		S	
LKGiM1004BH53	11- 57	BH		S	
LKGiM1004BH54	11- 58	BH		S	
LKGiM1004BH55	11- 59	BH		S	
LKGiM1004BH56	11- 60	BH		S	
LKGiM1004BH57	11- 61	BH		S	
LKGiM1004BH58	11- 62	BH		S	
LKGiM1004BH59	11- 63	BH		S	
LKGiM1004BH60	11- 64	BH		S	
LKGiM1004BH61	11- 65	BH		S	
LKGiM1004BH62	11- 66	BH		S	
LKGiM1004BH63	11- 67	BH		S	
LKGiM1004BH64	11- 68	BH		S	
LKGiM1004BH65	11- 69	BH		S	
LKGiM1004BH66	11- 70	BH		S	
LKGiM1004BH67	11- 71	BH		S	
LKGiM1004BH68	11- 72	BH		S	
LKGiM1004BH69	11- 73	BH		S	
LKGiM1004BH70	11- 74	BH		S	
LKGiM1004BH71	11- 75	BH		S	
LKGiM1004BH72	11- 76	BH		S	
LKGiM1004BH73	11- 77	BH		S	
LKGiM1004BH74	11- 78	BH		S	
LKGiM1004BH75	11- 79	BH		S	
LKGiM1004BH76	11- 80	BH		S	
LKGiM1004BH77	11- 81	BH		S	
LKGiM1004BH78	11- 82	BH		S	
LKGiM1004BH79	11- 83	BH		S	
LKGiM1004BH80	11- 84	BH		S	
LKGiM1004BH81	11- 85	BH		S	
LKGiM1004BH82	11- 86	BH		S	
LKGiM1004BH83	11- 87	BH		S	
LKGiM1004BH84	11- 88	BH		S	
LKGiM1004BH85	11- 89	BH		S	
LKGiM1004BH86	11- 90	BH		S	
LKGiM1004BH87	11- 91	BH		S	
LKGiM1004BH88	11- 92	BH		S	
LKGiM1004BH89	11- 93	BH		S	
LKGiM1004BH90	11- 94	BH		S	
LKGiM1004BH91	11- 95	BH		S	
LKGiM1004BH92	11- 96	BH		S	
LKGiM1004BH93	11- 97	BH		S	
LKGiM1004BH94	11- 98	BH		S	
LKGiM1004BH95	11- 99	BH		S	
LKGiM1004BH96	11-100	BH		S	
LKGiM1004BH97	11-101	BH		S	
LKGiM1004BH98	11-102	BH		S	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
LKGiM1004BH99	11-103	BH		S	
LKGiM1004BHA0	11-114	BH		S	
LKGiM1004BHA1	11-105	BH		S	
LKGiM1004BHA2	11-106	BH		S	
LKGiM1004BHA3	11-107	BH		S	
LKGiM1004BHA4	11-108	BH		S	
LKGiM1004BHA5	11-109	BH		S	
LKGiM1004BHA6	11-110	BH		S	
LKGiM1004BHA7	11-111	BH		S	
LKGiM1004BHA8	11-112	BH		S	
LKGiM1004BHA9	11-113	BH		S	
LKGiM1004BHB0	11-124	BH		S	
LKGiM1004BHB1	11-115	BH		S	
LKGiM1004BHB2	11-116	BH		S	
LKGiM1004BHB3	11-117	BH		S	
LKGiM1004BHB4	11-118	BH		S	
LKGiM1004BHB5	11-119	BH		S	
LKGiM1004BHB6	11-120	BH		S	
LKGiM1004BHB7	11-121	BH		S	
LKGiM1004BHB8	11-122	BH		S	
LKGiM1004BHB9	11-123	BH		S	
LKGiM1004BHC1	11-125	BH		S	
LKGiM1004BHC2	11-126	BH		S	
LKGiM1004BHC3	11-127	BH		S	
LKGiM1004BHC4	11-128	BH		S	
LKGiM1004BHC5	11-129	BH		S	
LKGiM1004BHC6	11-130	BH		S	
LKGiW7375BHZA	2- 40	BH		B	
LX-BZ6778BHZZ	2- 10	AA		C	
LX-BZ6782BHZZ	2- 1	AA		C	
LX-BZ6787BHZZ	1- 5	AB		C	
【M】					
MHNG-2324BHZZ	1- 9	AX		C	
MHNG-2325BHZZ	1- 11	AX		C	
MLEVF2324BHZZ	1- 4	AG		C	
MSPRP2372BHZZ	1- 3	AE		C	
【P】					
PFiLW2423BHZZ	2- 37	AP		D	
PFiLW6979BHZZ	1- 49	AV		D	
PGUMM2389BHZZ	1- 8	AE		C	
PGUMM6730BHZZ	1- 33	AS		C	
PGUMM6731BHZZ	1- 28	AR		C	
PGUMM6732BHZZ	1- 30	AS		C	
PGUMM6733BHZZ	1- 29	AR		C	
PGUMM6734BHZZ	1- 32	AL		C	
PRDAF6667BHZZ	4-147	AH		C	
PRNGT6641BHZZ	3- 15	AE		C	
PSHEG2859BHZZ	1- 38	AV		C	
PSHEP2471BHZZ	1- 45	AH		C	
PSHEP2472BHZZ	1- 44	AH		C	
PSHEP2861BHZZ	2- 57	AH		C	
PSHEP2862BHZZ	2- 58	AH		C	
【Q】					
QACCV6422BHZZ	2- 52	AY		B	
QCNCM1101BHZZ	4-148	AC		C	
QCNCM2656RC0C	8- 1	AE		C	
QCNCM2788BH0i	4-192	BL		C	
QCNCM7057BH08	4-193	AG		C	
QCNCM7057BHZZ	4-194	AB		C	
QCNCM7075BH0B	4-149	AB		C	
QCNCM7142BH1B	4-150	AD		C	
QCNCM7145RCZZ	11- 1	AZ		S	
QCNCM7176BH0E	4-151	AC		C	
QCNCM7176BH1J	4-195	AD		C	
QCNCM7203RC8J	5- 1	AN		C	
QCNCM7207BH4J	4-153	AQ		C	
〃	6- 25	AQ		C	
QCNCM7226BH0E	6- 23	AD		C	
〃	8- 19	AD		C	
〃	9- 11	AD		C	
QCNCM7226BH0H	4-154	AE		C	
QCNCM7230BH1E	6- 24	AL		C	
QCNCW1230AC3A	10- 2	AK		C	
QCNCW7081BHZZ	4-155	AB		C	
QCNCW7199BH0E	7- 2	AE		C	
QCNCW7204RC8J	4-156	AM		C	
〃	5- 2	AM		C	
QCNCW7217RC3J	6- 1	AK		C	
〃	10- 1	AK		C	
QCNW-2972BHZA	1- 12	AR	N	C	
QCNW-2973BHZZ	1- 19	AS		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
QCNW-2975BHZZ	2- 32	AY		C	
QCNW-2976BHZZ	1- 16	AK		C	
QCNW-2982BHZZ	7- 8	AN		C	
QCNW-2989BHZZ	4-157	AF		C	
QCNW-2990BHZZ	4-158	AP		C	
QCNW-2992BHZZ	2- 16	AF		C	
QCNW-2993BHZZ	2- 21	AG		C	
QCNW-2994BHZZ	6- 26	AE		C	
〃	9- 14	AE		C	
QCNW-2995BHZZ	1- 13	AF		C	
QCNW-2996BHZZ	1- 22	AD		C	
QCNW-3022BHZZ	4-198	AE	N	C	
QCNW-3024BHZZ	2- 63	AL	N	C	
QCNW-3030BHZZ	2- 29	BG	N	C	
QCNW-7212RCZZ	2- 52	AH		B	
QCNW-7708BHZZ	2- 44	AM		C	
QCNW-7895BHZZ	2- 67	AF	N	S	
QFS-C1035CCZZ	4-160	AE		A	
QFS-C5012BHZZ	4-161	AF		A	
QFS-D4341CCZZ	7- 3	AE		A	
QFSHD2109AFZZ	4-146	AC		C	
〃	7- 4	AC		C	
QPLGA0006QCZZ	2- 52	AQ		C	
QSŌCZ1012AC7B	4- 1	AP		C	
QSŌCZ6428ACZZ	4-162	AE		C	
QSW-C1262QCZZ	7- 9	AR		B	
QSW-S2403BHZZ	9- 10	AW		B	
QSW-S6894BHZZ	4-163	AK		B	
QTANN6658RCZZ	7- 5	AH		C	
QTANP0004BHZA	2- 60	AE		C	
QTANZ6661BHZZ	2- 14	AE		C	
【R】					
RALMB6640RCZZ	4-164	AF		B	
RC-CZ2201RC0F	8- 2	AE		C	
RC-EZ106ARC1A	4-137	AD		C	
〃	6- 21	AD		C	
〃	9- 12	AD		C	
RC-EZ2271RC1A	4-165	AM		C	
RC-EZ336ARC1A	4-166	AB		C	
RC-FZ1041RC2E	7- 6	AE		C	
RC-FZ8231RC2A	8- 10	AG		C	
RC-KZ1054CCZZ	6- 22	AB		C	
RCiLC6647BHZZ	4-167	AK		C	
RCiLC6652RCZZ	4-168	AK		C	
RCiLC6653BHZZ	4-169	AS		C	
RCiLC6654BHZZ	7- 7	AR		C	
RCiLC6667BHZZ	8- 3	AN		C	
RCiLF0050FCZZ	4-170	AG		C	
RCiLZ1003BHZZ	4-143	AF		C	
RCiLZ5017SCZ/	6- 2	AF		C	
RCiLZ5017SCZZ	4- 14	AB		C	
〃	4- 77	AB		C	
RCŌRF1008ACZZ	4- 78	AB		C	
RCŌRF2031SCZZ	1- 50	AN		C	
〃	2- 66	AN		C	
RCŌRF6691BHZZ	4-144	AD		C	
RCŌRF6695BHZZ	2- 51	AK		C	
〃	7- 10	AK		C	
RCŌRF6697BHZZ	2- 31	AF		C	
RCŌRF6698BHZZ	2- 34	AR		C	
RCŌRF6699BHZZ	3- 8	AU		C	
RCŌRF6700BHZZ	2- 65	AS		C	
〃	3- 9	AS		C	
RCŌRF6702BHZZ	4-145	AF		C	
RCŌRF6709RCZZ	1- 27	AL		C	
RCRMZ1016LCZZ	4- 54	AF		B	
RCRMZ7002RCZZ	6- 3	AE		B	
RCRSP5019BCZZ	4-134	AD		B	
RCRSP6676RCZZ	4-171	AG		B	
RCRSZ2396RCZZ	4- 55	AL		B	
RCRSZ2399RCZZ	4- 60	AL	N	B	
RCRSZ6644RCZZ	4-172	AD		B	
RMPTQ4330QCJJ	4- 58	AC		B	
RTRNH6894RCZZ	4-173	AU		B	
RTRNH9521BHZZ	8- 4	BB		B	
RTRNP2403BHZZ	2- 25	BL	N	B	
RVR-B5310QCZZ	4-196	AG		B	
RVR-M2415QCN3	4-174	AE		B	
【S】					
SPAKA8454BHZZ	3- 2	AN		D	
SPAKA8455BHZZ	3- 4	AN		D	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
SPAKC3033BHZZ	3- 1	AY	N	D	
SSAKA5004CCZZ	3- 7	AA		D	
SSAKH0003DHZZ	3- 3	AE		D	
SSAKH3015CCZZ	3- 5	AA		D	
SSAKH4231CCZZ	3- 10	AA		D	
【T】					
TCADH6788BHZA	3- 11	AC		D	
TCADZ2001BHZA	3- 17	AM		D	
TCAUS6677BHZZ	2- 50	AD		D	
TGANE1001BHZC	3- 16	AG		D	
TiNSE2378BHZZ	3- 6	BM	N	D	
TiNSE2382BHZZ	3- 6	BC	N	D	
TiNSF2380BHZZ	3- 6	BM	N	D	
TiNSF2384BHZZ	3- 6	BC	N	D	
TiNSG2379BHZZ	3- 6	BM	N	D	
TiNSG2383BHZZ	3- 6	BC	N	D	
TiNSS2381BHZZ	3- 6	BM	N	D	
TiNSS2385BHZZ	3- 6	BC	N	D	
TLABG6967BHZZ	2- 48	AC		D	
TLABG7097BHZZ	2- 49	AF		D	
TLABH2460BHZZ	2- 55	AE		D	
TLABH6996BHZZ	2- 64	AD		D	
【U】					
UBATN2338RCZZ	2- 45	BE		B	
UBNDA6630BHZZ	3- 12	AK		C	
UKŌG-6705RCZZ	11- 3	BC		S	
UKŌG-6718RCZZ	11- 2	BE		S	
【V】					
VCCCTV1HH100J	4- 70	AA		C	
VCCCTV1HH101J	4- 7	AA		C	
〃	4- 63	AA		C	
VCCCTV1HH150J	4- 10	AA		C	
VCCCTV1HH221J	4- 67	AA		C	
VCCCTV1HH331J	4- 8	AA		C	
〃	4- 66	AA		C	
〃	6- 4	AA		C	
〃	9- 1	AA		C	
VCCCTV1HH470J	4- 74	AA		C	
VCCCTV1HH471J	4- 9	AA		C	
〃	4- 72	AA		C	
VCCCTV1HH681J	6- 5	AA		C	
VCCCTV1HH8R0J	4- 71	AC		C	
VCEAEU1CW106M	4-136	AA		C	
VCEAGA1HW105M	4-142	AB		C	
VCEAGA1HW106M	4-139	AA		C	
VCEAGA1HW107M	4-140	AA		C	
VCEAGA1HW224M	4-135	AA		C	
VCEAGD1CW108M	4-175	AE	N	C	
VCEAGU1HW108M	4-176	AF		C	
VCEAGU1HW477M	4-177	AD		C	
VCEAGU1HW478M	4-178	AL		C	
VCEAPS1CC106M	4- 4	AC		C	
VCEAPS1CC225M	8- 6	AF		C	
VCEAPS1CC226M	8- 7	AC		C	
VCEAPS1CC336M	6- 6	AF		C	
VCEAPS1CC475M	9- 2	AG		C	
VCEAPS1EC476M	4- 6	AF		C	
〃	5- 3	AF		C	
VCEAPS1HC104M	4- 5	AD		C	
VCKYTV1CF105Z	4- 68	AB		C	
〃	8- 11	AB		C	
VCKYTV1HB102K	4- 2	AA		C	
〃	4- 61	AA		C	
〃	6- 7	AA		C	
〃	8- 12	AA		C	
VCKYTV1HB103K	4- 69	AB		C	
VCKYTV1HB182K	6- 8	AA		C	
VCKYTV1HB222K	4- 64	AA		C	
VCKYTV1HB332K	4- 65	AA		C	
VCKYTV1HB333K	4- 73	AA		C	
〃	9- 3	AA		C	
VCKYTV1HB334K	9- 4	AE		C	
VCKYTV1HB472K	6- 9	AA		C	
VCKYTV1HF104Z	4- 3	AA		C	
〃	4- 62	AA		C	
〃	6- 10	AA		C	
〃	9- 5	AA		C	
VCQYNA2AM103K	4-138	AA		C	
VCQYNU1HM153K	4-141	AA		C	
VHD1SS353//-1	4- 13	AB		B	
〃	4- 76	AB		B	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VHD1SS353//-1	6- 11	AB		B	
VHDCP301///-1	4-179	AL		B	
VHDSFPB54//-1	4- 12	AC		B	
〃	4- 75	AC		B	
〃	8- 13	AC		B	
VHDSFPL52V/-1	4- 11	AC		B	
VHEMTZ5.1A/-1	4-180	AC		B	
VHEMTZJ13C/-1	4-181	AA	N	B	
VHERD30PB//-1	4-127	AD		B	
VHERD5.6PB/-1	4-126	AD		B	
VHEUDZ33B//-1	4-128	AC		B	
VHi2032ARAB1A	4- 34	AZ		B	
VHi27256RDH1A	4-184	AW		B	
VHi28F016SU70	4- 57	BR		B	
VHi51V8512T12	4- 38	BG		B	
VHi74AHCT245D	4- 56	AP		B	
VHi74HC138DR/	4-131	AK		B	
VHi74LV08/DR/	4- 82	AK		B	
VHi74LV138DR/	4- 35	AP		B	
VHi74LV14/DR/	4- 84	AK		B	
VHi74LVX00/SJ	4- 32	AL		B	
VHi74LVX08/SJ	4- 83	AG		B	
VHi74LVX32/SJ	4- 30	AL		B	
VHiBA10339F-1	4- 39	AD		B	
VHiBA10393F-1	4- 81	AC		B	
VHiBR6265BF10	4- 28	AR		B	
VHiH4728B02FS	4-129	AW		B	
VHiH641510810	4- 36	BA		B	
VHiHY514264B6	4- 37	AW		B	
VHiKiA7045F-1	4-197	AL	N	B	
VHiKiA7806P-1	4-182	AK		B	
VHiL4960///-1	4-183	AM		B	
VHiLT1184CS-1	8- 5	BE		B	
VHiLZ9FK13/-1	4- 31	BA		B	
VHiLZ9FT18/-1	4- 21	AZ		B	
VHiM89635N010	6- 12	BA		B	
VHiMB62H149-1	4- 22	BC		B	
VHiMC145406F1	4- 16	AL		B	
VHiMC34063AM1	4- 29	AG		B	
VHiMC68B54/-1	4-185	BB		B	
VHiMN89303/-1	4- 40	BD		B	
VHiRH5RE33A-1	4- 85	AF		B	
VHiS29390AFJA	6- 13	AL		B	
VHiSN74HC00DR	4- 24	AG		B	
〃	4- 80	AG		B	
VHiSN74HC04DR	4- 25	AG		B	
VHiSN74HC08DR	4- 27	AL		B	
VHiSN74HC74D1	4- 26	AG		B	
VHiSN74HCU04D	4- 23	AG		B	
VHiSN74LS125R	4-132	AL		B	
VHiSN74LS393N	4- 33	AW		B	
VHiSN75115NS1	4- 18	AN		B	
VHiSN75189DR/	4- 17	AK		B	
VHiTD62308F-1	4- 15	AH		B	
VHiUPD71037GB	4-130	AY		B	
VHiW42C3103G/	4- 59	AU	N	B	
VHiZ84C0006FE	4- 19	AT		B	
VHiZ84C3006FE	4- 20	AT		B	
VHPRPM851//-1	9- 6	AT		B	
VHViCPS0.5/-1	8- 14	AF		B	
VHViCPS1.0/-1	4- 79	AF		B	
VRD-RB2HY394J	7- 1	AA		C	
VRD-RC2EY221J	4-186	AA		C	
VRS-RE3AAR39J	4-187	AB		C	
VRS-RE3LA151J	4-188	AC		C	
VRS-TQ2BB000J	6- 20	AA		C	
VRS-TQ2BB331J	9- 7	AA		C	
VRS-TQ2BB340J	9- 8	AB		C	
VRS-TQ2BB470J	9- 9	AB		C	
VRS-TS2AD000J	4- 48	AA		C	
〃	4-105	AA		C	
VRS-TS2AD100J	4-107	AA		C	
VRS-TS2AD101J	4-112	AA		C	
VRS-TS2AD102J	4- 46	AA		C	
〃	4-100	AA		C	
〃	6- 14	AA		C	
VRS-TS2AD103J	4- 43	AA		C	
〃	4- 90	AA		C	
〃	6- 15	AA		C	
VRS-TS2AD104J	4-122	AA		C	
〃	8- 15	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VRS-TS2AD105J	4- 47	AA		C	
〃	4-104	AA		C	
VRS-TS2AD112J	4-119	AA		C	
VRS-TS2AD122F	4-109	AA		C	
VRS-TS2AD122J	4- 98	AA		C	
VRS-TS2AD123J	4- 96	AA		C	
VRS-TS2AD133F	8- 8	AA		C	
VRS-TS2AD143F	4-115	AB		C	
VRS-TS2AD152G	4- 94	AA		C	
VRS-TS2AD152J	4-120	AA		C	
VRS-TS2AD153G	4- 50	AA		C	
VRS-TS2AD153J	4- 99	AA		C	
VRS-TS2AD162J	4-101	AA		C	
VRS-TS2AD203J	6- 16	AA		C	
VRS-TS2AD222J	4- 93	AA		C	
〃	8- 16	AA		C	
VRS-TS2AD223J	4-116	AA		C	
VRS-TS2AD224J	8- 17	AA		C	
VRS-TS2AD272G	4- 51	AB		C	
VRS-TS2AD272J	4-125	AA		C	
VRS-TS2AD302J	4-102	AA		C	
VRS-TS2AD303F	4-121	AA		C	
VRS-TS2AD330J	4- 42	AA		C	
〃	4- 89	AA		C	
VRS-TS2AD334J	4-103	AA		C	
VRS-TS2AD362F	4-108	AA		C	
VRS-TS2AD392G	4- 97	AA		C	
VRS-TS2AD432J	4-114	AA		C	
VRS-TS2AD470J	4-111	AA		C	
VRS-TS2AD472F	4-199	AA		C	
VRS-TS2AD472J	4- 44	AA		C	
〃	4- 91	AA		C	
〃	8- 9	AA		C	
VRS-TS2AD473J	4- 45	AA		C	
〃	4- 92	AA		C	
VRS-TS2AD512F	4-123	AA		C	
VRS-TS2AD513J	4-124	AA		C	
VRS-TS2AD561J	4- 95	AA		C	
VRS-TS2AD562J	4-106	AA		C	
VRS-TS2AD563J	4- 52	AA		C	
VRS-TS2AD622J	4-118	AA		C	
VRS-TS2AD681J	4-110	AA		C	
VRS-TS2AD802J	4-117	AB	N	C	
VRS-TS2AD822J	6- 17	AA		C	
VRS-TS2AD912G	4- 53	AA		C	
VRS-TS2HD130J	4- 41	AD		C	
VRSTS2AD1032F	4-113	AB	N	C	
VS2SA1270-/-1	4-133	AF		B	
VS2SC4153//-1	4-190	AH		B	
VS2SC4352//-1	4-189	AF		B	
VS2SC4699KP-1	4- 87	AC		B	
VS2SD2391//-1	8- 18	AD		B	
VS2SJ187-//-1	4- 88	AF		B	
VSDTA124EK/-1	6- 18	AD		B	
VSDTC114YK/-1	4- 86	AC		B	
VSDTC124TK/-1	6- 19	AD		B	
VVLLM10V33/-1	1- 26	CS		E	
【X】					
XBBSD30P08000	1- 43	AA		C	
XBPBZ40P06K00	2- 18	AA		C	
XBPSD30P08KS0	4-191	AA		C	
XBPSD40P08KS0	2- 24	AA		C	
XEBSD30P06000	1- 53	AA		C	
〃	2- 26	AA		C	
XEBSD30P08000	1- 15	AA		C	
〃	2- 7	AA		C	
XEBSD30P10000	2- 59	AA		C	
XEBSF30P10000	2- 47	AA		C	
XEPSD30P08000	1- 18	AA		C	
XHBSD30P04000	2- 15	AA		C	
XHBSD30P05000	1- 14	AA		C	
XHBSD30P06000	2- 20	AA		C	
XJSSD26P08000	2- 61	AA		C	
XJSSD30P08000	1- 39	AA		C	
XJSSD30P10000	1- 6	AA		C	
XUBSD40P08000	1- 10	AA		C	
XUPSD40P12000	1- 51	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	

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SHARP CORPORATION
Information Systems Group
Quality & Reliability Control Center
Yamatokoriyama, Nara 639-1186, Japan
1999 March Printed in Japan Ⓣ